TECHNOLOGY DEPT:

NATIONAL PETROLEUM NEWS

November 29, 1939

PUBLIC LIBRARY
NOV 30 1939
DETROIT

Lester M. Goldsmith

Chief Engineer for The Atlantic Refining Co., to be awarded Melville medal by A. S. M. E.

REFINING TECHNOLOGY EDITION

4 Vital Reasons Why Buyers Choose TOKHEIM
1 COMMANDING APPEARANCE
2 LOWER MAINTENANCE COST
3 PERMANENT ACCURACY • •
4 GREATER DEPENDABILITY
BRAND
● Tokheim asked thousands of buyers why they chose Tokheim pumps and this in substance is what they said: "Their commanding appearance brings in many customers; their accuracy of measurement is as permanent as the pumps themselves; they never fail to function under any practical condition; and they operate with lowest service cost and trouble." What finer proof could be found that Tokheim is the buy today? Write for new color folder and details.
QUALITY
TOKHEIM
COMPARE THE VALUE
THE PUMP THAT COUNTS
TOKHEIM OIL TANK & PUMP CO.
DESIGNERS AND BUILDERS OF SUPERIOR EQUIPMENT
FORT WAYNE FOR 38 YEARS INDIANA

FOR EVERY ELECTRICAL NEED...SPECIFY WESTINGHOUSE

GOOD LIGHTING BRINGS THEM IN... GOOD SERVICE BRINGS THEM BACK

Westinghouse lighting helps draw trade, and Westinghouse electrical equipment helps you hold it.

Take a tip from thousands of successful service stations. Brighten up with Westinghouse lighting, and get the business that passes up poorly lighted stations.

Westinghouse can help you hold this business, too. Prompt service depends much on reliable operation of pumps, air compressors, and similar equipment. Power these with Westinghouse motors, control and Nofuze panelboards and forget delays, failures, maintenance expense. You'll be able to pay more attention to getting business, instead of worrying about your apparatus, and your operating costs.

You can obtain complete electrical service from Westinghouse — through our 137 sales and service offices in principal cities. A phone call will bring a well-informed representative.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pennsylvania. J-94113

AFA floodlight, for station buildings and service areas. Open-type, porcelain-enameled units with aluminum auxiliary reflectors.

Nofuze Panelboard—Tamper-proof; eliminates delays due to unnecessary circuit interruptions; saves time annoyance, maintenance expense.

Bipost Pump Island Lighting Unit — Provides wide distribution of light needed for quick, accurate service at pump islands.

Westinghouse

ELECTRICAL PARTNER OF THE PETROLEUM INDUSTRY

W WESTINGHOUSE ELECTRIC

G. B. Dickey

G. B. Dickey, of Nashville, new president of the Tennessee Oil Men's Association, started as a retail service station operator in Nashville, but soon entered the wholesale branch, marketing a specialized motor oil for Model "T" cars. Later his business was consolidated with Benzol Gas Corp. which, in 1929, was one of six local oil companies merged by Caldwell & Co. into Apex Oil Corp. He was connected with the Apex corporation as vice president until 1934 when he organized his own company, American Oil Co. of Tennessee, Inc., which now distributes Shell products.

Mr. Dickey has long been active in Tennessee association affairs, serving as secretary-treasurer from 1924 to 1926, and as secretary of the reorganized association last year.

Commenting on the changes occurring during his 19 years in the oil business, Mr. Dickey says, "We are doing business today and making a little money on the kind of spreads we used to use for advertising." But he is confident of the independent marketer's ability to meet changing conditions.

In this connection, Mr. Dickey has some kind words for NATIONAL PETROLEUM NEWS saying:

"I might add that your valuable publication through the years has been of untold value in making decisions and policies to cope with changing conditions."

NATIONAL PETROLEUM NEWS

VOLUME 31 WEDNESDAY, NOVEMBER 29, 1939 NUMBER 48

Trucks, Trades And Barges Cut Into Pipelines

By Teletype
N. P. N. News Bureau

TULSA, Nov. 27.—The gradual but important changes occurring in the mid-western marketing picture were brought into sharp focus for a short time recently at the Chicago hearing by the Interstate Commerce Commission on the Petroleum Rail Shippers Ass'n. petition which closed Nov. 21.

These changes are being brought about by:

(1) More efficient methods of transportation.

(2) Availability of voluminous amount of crude oil nearer the areas of heavy consumption.

Harry Moreland, general manager of the Great Lake Pipeline Co., the pioneer gasoline pipeline from the Mid-Continent to mid-western markets, testified the company's tonnage this year is off 26 per cent from last year, and that he anticipates an even greater loss of tonnage next year.

Mr. Moreland said competitive transportation in the form of pipelines, marine facilities and truck operations, along with Illinois crude production, were largely responsible for the drop in tonnage.

In delving behind Mr. Moreland's testimony for more complete details it might be well to look first at the situation in the western edge of the middlewestern markets served by the Great Lakes system.

No doubt the Cimarron Valley Pipeline Co. (Champlin Refining Co.), with its terminal at Superior, Neb., and the heavy transport trucking from Kansas refiners to Kansas destinations as well as those in Nebraska and Iowa and to some extent into Missouri, have cut into the business of the member refiners of the Great Lakes group.

By looking at the accompanying table (see Page 15) it will be noted that Barnsdall Refining Co., one of the original stockholders in the line, is no longer listed as a member. Barnsdall for the past several months has been drawing its

(*Continued on page* 15)

Cole Sets Dates

By Teletype

WASHINGTON, Nov. 29.—New Orleans hearings of the Cole "oil subcommittee" have been moved up two days, Chairman Cole's office told NPN today. They will be held Dec. 11, 12 and 13, instead of 13, 14 and 15 as previously planned. Committee will leave Washington, as planned, Dec. 7, for Mattoon, Ill., and will go from there direct to New Orleans, after inspecting the Illinois fields. Projected visits to Shreveport and Longview to inspect Louisiana and East Texas fields probably will be taken after the hearings, which were moved up on request of several state authorities which have meetings scheduled for Dec. 14 and 15.

Truckers' Contracts Opened

WASHINGTON, Nov. 28. — Contracts of contract motor carriers, showing minimum charges, actual charges, and other information, will be opened to public inspection at Interstate Commerce Commission under an ICC order just issued.

Producers Plan Suit To Halt 'Tariff' Cut

N. P. N. News Bureau

WASHINGTON, Nov. 27. — Although the reciprocal trade agreement with Venezuela, cutting in half the present excise tax of 21 cents per barrel on U. S. imports of foreign crude and fuel oils, has been proclaimed by the President and will become provisionally effective Dec. 16. Independent oil producers in this country have not yet given up hope of sidetracking it.

Independent Petroleum Assn. of America, for one, is contemplating a suit to block the treaty's becoming effective — other industries similarly affected may be expected to join IPAA.

Russell B. Brown, chief counsel of IPAA, revealed after the proclamation of the treaty by the White House that he had written President Roosevelt subsequent to the announcement of the treaty by the State Department and prior to its signature by the President, asking to present certain data which, he said, had not been previously brought out in discussion of the pact. His letter was never answered.

'Leave Import Taxes Alone'

What Mr. Brown was expected to have pointed out to the President was the fact that Chairman Pat Harrison of the Senate Finance Committee asserted on the Senate floor that excise taxes would be unaffected by the reciprocal trade agreement program, and that both Senate Finance and House Ways and Means Committee reports on the bill, previous to its enactment, also pointed out that it would leave import excise taxes alone.

The reduced import tax, under the Venezuela agreement, applies only to 5 per cent annually of the volume of crude petroleum processed in continental U. S. refineries during the preceding year. On the basis of 1938 runs to stills, imports—from Venezuela and all other countries — during 1939 under such a treaty, could be but 58,000,000 barrels. Total imports during the five-year pe-

250 Billion Motor Miles To Be Traveled in '39

NEW YORK, Nov. 21.—Two million more people are operating passenger cars today than in the lush days of 1929 and almost a million more trucks are serving the farmer and business man, according to the forthcoming issue of "Automobile Facts," published by the Automobile Manufacturers Ass'n.

In the U. S., which owns 70 per cent of the world's automobiles, two out of every three families now own a private car. Total mileage this year will be about 250 billion miles of motor transportation or about 70 billion miles more than in 1929.

California Indictment Hits At State Fair Trade Laws

N. P. N. News Bureau

CLEVELAND, Nov. 27.—Does the California oil indictment constitute an indirect attack by the Roosevelt Administration on state fair trade laws which provide for contracts specifying resale prices for branded products?

This question was raised by inclusion in the indictment, returned Nov. 14 by a federal grand jury at Los Angeles, of the Fair Practices Association (Petroleum Products), along with 39 oil companies and the Independent Refiners Association, Inc. (See NPN, Nov. 22).

The F.P.A. was incorporated March 12, 1937 under California laws in accordance with the state fair trade law (although no mention of this angle was made in the indictment).

It was charged in the indictment that the F.P.A. made semimonthly surveys of retail gasoline prices at service stations, reporting to member oil companies on the brand sold, prices posted and prices charged.

Most of the major oil companies and their secondary companies operating in California, as well as most of the independent refiners, are said to have made use of the California fair trade law, entering into contracts with some of their retailers, at least, to stipulate a minimum price for their branded products. Any retailer selling at less than the price specified by his supplier—even though he himself had not signed a contract with the supplier—was open to a lawsuit by the supplier or any other dealer handling the same brand, with possible damages.

Checked Stations

Suppliers generally have remained in the background leaving it to the dealers' association to bring legal actions against retailers charged with selling at less than the specified price. One reason for this, undoubtedly, was the apprehension that the supplier might lose his outlets to a competitor, if he filed suit. But the F.P.A. offered the companies a means of checking up on how their retail outlets were adhering to respective suppliers' specified prices.

Nearly all of the states had fair trade laws on their books before Congress enacted the

(*Continued on page* 6)

riod ended with 1938 averaged about 34,000,000 barrels annually.

However, Mr. Brown points out, under the "most favored nation" agreement, not only Venezuelan crude and fuel oil, but similar commodities from other exporting countries, notably Colombia and Mexico, could come into the United States up to the 5 per cent limitation.

Filing of the legal action, it is understood, would be based on the contention that the administration has not the authority to change an excise tax witnout specific authorization by Congress in each case. Congress had understood excise taxes would not be changed in trade treaties, Mr. Brown said.

"The reduction of the tax will give two or three major companies the right to determine petroleum prices in the United States," Mr. Brown continued. "Companies with production abroad can produce more cheaply than in the United States, and the importation of even a small amount is capable of driving domestic prices down.

Mexico Can Take Advantage of 'Tariff' Cut; Eastern States Reported Leasing Storage

"Mexico can apparently take advantage of this treaty to export oil to this country from expropriated American properties on which the Mexican government has to pay no plant overhead. This, too, will tend to break oil prices here."

In this connection, it is reported that Eastern States Oil Co., which has been refining Mexican crude in this country, mostly in bond, has leased additional storage space at Galveston and Houston.

At the same time, Mexican government authorities are reported to have closed a deal with an undisclosed American importer to sell more Mexican oil in the U. S.

William S. Farish, president of Standard Oil Co. of N. J., in his statement at the American Petroleum Institute meeting in Chicago a week ago, revealed that he had conferred with State Department officials on the slashing of the oil import tax in the Venezuela treaty subsequent to the open hearings on the measure, at which Mr. Brown appeared. It could not be learned whether the Reciprocity Information Committee (which handles negotiations for treaties for the State Department) had consulted with other oil companies or officials aside from the open hearings.

Pointed Out Four Years Ago

The oil import excise tax is the second such tax altered under the reciprocal trade agreement program—the first was the excise tax on imported lumber, reduced in the 1935 Canadian trade agreement. At that time NATIONAL PETROLEUM NEWS pointed out (See NPN, Nov. 20, 1935, p. 89) that "reduction of the excise tax on imported lumber in the Canadian trade treaty signed Nov. 15 (1935) opens the way to a similar cut in oil import taxes in the future, according to views expressed in oil circles today."

However, now that both oil and lumber excise duties have been cut, the Reciprocity Information Committee is contemplating a change in the import excise tax on copper, in connection with the Chile trade agreement, hearings on which opened here today. Mr. Brown attended these hearings, and it is understood that, if the copper import tax is cut in the treaty, he may be joined in the contemplated legal action by the copper, as well as the lumber and coal, industries.

Another legal point under consideration in connection with the proposed suit, is whether it will be a mandamus action or a *quo warranto* action.

Madison Dismissals Upheld, Tie Vote Leaves Door Open

N. P. N. News Bureau

WASHINGTON, Nov. 27.—U. S. Supreme Court has upheld the decision of the seventh U. S. Circuit Court of Appeals (N.P.N., Feb. 22, p. 15) refusing to issue a writ of mandamus ordering Judge Patrick J. Stone to rescind his orders of July 19, 1938, dismissing 11 defendants in the "first" Madison case after they had been found guilty by a jury.

However, the lower court's order was sustained by a 4-to-4 vote in the high court, which leaves the way open for the Justice Department to petition for a reargument of the case before the full court when a ninth member is appointed. The petition must be filed within 25 days after the decision, but in the usual court routine it may be expected to await its turn for reargument until after a new member is appointed by President Roosevelt.

Justice Department attaches have indicated that the department probably will ask for reargument and reconsideration.

It is interesting to note that, while no indication of individual votes was given in the *per curiam* order upholding the circuit court, the court is now divided along New Deal-Old Deal lines. The four New Deal appointees are Justices Black, Douglas, Frankfurter and Reed; those who were on the bench before the Roosevelt Administration are Chief Justice Hughes, Justice Stone, McReynolds and Roberts.

Talk of appointing U. S. Attorney General Frank Murphy to the vacancy on the supreme court raises an interesting question. Should Mr. Murphy be appointed, would he have to withdraw during reargument of the Madison dismissal case because it was prepared in the Department of Justice while he was head of that department? If he would withdraw, then there would still be a 4-4 tie vote, so there wouldn't be any use in asking for a reargument.

Defendant individuals dismissed by Judge Stone's order of July 19, 1938 were: E. G. Seubert and Allan Jackson, president and vice president, respectively, of Standard Oil Co. of Indiana; Jacob France, Baltimore, president of Mid-Continent Oil Corp.; A. V. Bourque, Tulsa, formerly secretary of Western Petroleum Refiners Assn., Dan Moran, Ponca City, Okla., president of Continental Oil Co.; W. G. Skelly, Tulsa, president of Skelly Oil Co.; H. M. Dawes, Chicago, president of The Pure Oil Co.; C. L. Jones, formerly with Socony-Vacuum Oil Co.; Bryan S. Reid, Chicago division manager of Socony-Vacuum; and Frank Phillips, Bartlesville, Okla., now board chairman of Phillips Petroleum Co. The one oil company dismissed at that time was Globe Oil & Refining Co. of Kansas.

California Indictment Hits At State Fair Trade Laws

(*Continued from page* 5)

Miller-Tydings Bill which purported to authorize interstate companies to enter into resale price maintenance contracts under state laws, without fear of violating federal anti-trust laws. These laws were strongly backed by independent druggists and other small merchants who wanted minimum prices set on branded merchandise as a weapon against cut-price chain stores.

President Roosevelt did all he could to head off the Miller-Tydings Bill, but it finally passed as a "rider" on an appropriation bill and the President reluctantly signed it. The Federal Trade Commission, too, opposed the measure on the grounds that it would "weaken" the anti-trust laws. But, with hundreds of "little business men"—who ordinarily favor tightening of the anti-trust laws—swarming the Capitol in support of fair trade laws, Congress apparently paid little attention to the FTC's objection.

The FTC has been silent, but unrelenting, in its opposition and even now has under way an investigation of the effect of fair trade laws on prices. Results of this survey will be presented to the Temporary National Economic (Monopoly) Committee.

One view of the Roosevelt Administration's opposition to state fair trade laws was that they "took the play away from Washington."

So, developments in the California oil case will be watched with interest by business men in many lines of trade, as well as oil men, especially in New Jersey and New York areas where major company suppliers have also made use of state fair trade laws to specify minimum prices for their branded motor fuels. The case approaches the question of how far the federal government can go in prosecuting an association that might almost be called a quasi-enforcement agency under a state law.

Oil Burner Shipments Rise

WASHINGTON — American manufacturers shipped 35,352 oil burners in September, bringing the nine-month total to 146,987 as compared with 97,810 burners shipped in same period of 1938, and 149,870 in 1937.

September shipments of distillate burners totaled 75,886 bringing January-September total to 269,965 as against 214,749 and 296,125 in same periods of 1938 and 1937, respectively.

'Clean' Rest Rooms Required Under New Topeka Ordinance

N. P. N. News Bureau

CLEVELAND, Nov. 27.—An ordinance prohibiting all gasoline price signs, except those on pumps, and requiring maintenance of clean rest rooms at service stations, became effective in Topeka, Kans., Nov. 23. The ordinance also provides for the awarding of gold stars to stations passing inspections and complying with all regulations.

The ordinance, which was passed by the Topeka Board of Commissioners and approved by the mayor on Nov. 21, provides that pump signs shall have an area not greater than 96 square inches. Figures, including fractions, in the sign shall be of the same size, and not smaller than one-half the size of the figures showing the total selling price per gallon. Taxes collected in connection with the sale of gasoline must be shown apart from the total sales price.

Prices must remain in effect for at least 24 hours, except to meet a "posted competitive price in that community." The law forbids substitution and misbranding, stating that "it shall be unlawful for any person to sell or offer for sale motor fuel at retail in any manner so as to deceive or tend to deceive the purchaser as to the price, nature, quality or identity thereof."

Gasoline pumps are to be inspected every six months by the city weights and measures department. New equipment also is to be inspected and certified **Towels, Tissue & Soap Required** by the department before used.

The ordinance requires rest rooms for public use be "clean, sanitary and provided with tissue, soap contained in a soap dispenser, and paper towels." Regular inspection of station rest rooms by the sanitary department of the city is also provided.

Gold stars, awarded by the city to all stations passing regular inspection and meeting all requirements of the ordinance, will be approximately four inches in diameter, bearing the imprint of the city. They are for display at the station. Stars remain the property of the city, and will be taken down when a station fails to pass all requirements.

Passage of the ordinance resulted from "the co-operation of a heavy majority of the retail dealers of Topeka, led by the well-organized efforts of the Petroleum Retailers Ass'n. (of Kansas)," according to E. E. Heidt, Topeka, president of the state retailers association.

Trade Agreements Defended By Secretary of State Hull

By Teletype
N. P. N. News Bureau

WASHINGTON—The administration's reciprocal trade agreement program was vigorously attacked and defended as hearings opened here this week on the proposed treaty with Chile.

Chief attackers of the program were Senators Wheeler of Montana and Johnson of Colo., both democrats. Interest of the westerners in the Chilean agreement centers around the proposal to reduce the import excise tax on copper in much the same manner that the import tax on oil was reduced in the Venezuelan agreement.

In a statement issued just as the Chilean hearings began before the committee for reciprocity information, Secretary Hull declared that the trade agreements program had been developed in an effort to increase prosperity and employment at home and that if the philosophy of the program were put aside and "our trade policy is again to be determined solely by the short-sighted and mistaken claims of particular interests determined to win a completely favored position for themselves" then this country would "fall again into the disorderly depression that followed the Hawley-Smoot tariff."

The western senators described the program as "an invidious formula for breaking down our tariff walls."

The controversy presages a definite battle in Congress next session when the program comes up for renewal. Unless renewed it will expire on June 12.

Northwest Meeting Dates Set

MINNEAPOLIS — North Dakota division of Northwest Petroleum Ass'n. will meet Jan. 22 and 23 in Gardner Hotel, Fargo, and Minnesota division, Jan. 25 and 26, in Nicollet Hotel, Minneapolis.

Contents...

• NEWS

Producers Plan Suit to Halt 'Tariff' Cut 5
California Indictment Hits at State Fair Trade Laws 5
Trucks, Trades and Barges Cut Into Pipelines 5
Madison Dismissals Upheld, Tie Vote Leaves Door Open 6
Trade Agreements Defended by Secretary of State Hull 7
'Clean' Rest Rooms Required Under New Topeka Ordinance 7
Wage-Hour Division Ducks Ruling on Coal Producers 8
Helps for Marketers Feature Nebraska Program 9
Wage-Hour Report States Wholesalers are Under the Law 9
'Gas' Grading Law Drawn Up for District of Columbia 9
Oil Tax News 10
Industry Watches Nebraska, Devonian Well in Salem Pool 10
First Nebraska Oil Run at Omaha Plant 11
The Editor's Page 12
Army Interested in Campaign for Uniform Sizes, Weights 14
Colorado Rates to Be Slashed 14
Federal Agency Maps War on State Trade Barriers 14
Germany's Oil Supply Held Underestimated . 18
All States Share in Gain in 1939 'Gas' Consumption 19

• MERCHANDISING

For Even Bigger Winter Change-Over Markets 21
Make Stations Christmas "Gift Headquarters" 22
Service Station School 26
New Equipment and the Manufacturers..... 32

• MARKETS

Mid-Continent 34
Eastern 34
Gulf 34
Mid-Western 34
California 34
Pennsylvania 34
Refinery Tank Car Markets 35, 36
Tank Wagon Markets 37, 38
Seaboard Markets. 40
Crude Oil Markets 41, 42

Copyright 1939 by The National Petroleum Publishing Co.
Trade Mark Registered U. S. Patent Office.

Published every Wednesday by The National Petroleum Publishing Co.
WARREN C. PLATT, *Editor and Publisher*
V. B. GUTHRIE, *Managing Editor*

Member of Audit Bureau of Circulation and Associated Business Papers, Inc.

Publication office: 1213 W. Third St., Cleveland, Ohio, U.S.A. Telephone, CHerry 7672. Cable Address, Plattoil, Cleveland

NEWS BUREAUS

New York, 50 W. 50th Street, Telephone, Columbus 5-1516 and 5-1517.
Chicago, Buckingham Bldg., 59 E. Van Buren Street, Telephone, Harrison 5901-2-3.
Washington, D. C., 1002 National Press Bldg., Telephone, NAtional 0654.
Tulsa, Okla., 904 World Bldg., Telephone, 3-7132.
Los Angeles, 610-A Hillstreet Bldg., 815 South Hill Street, Telephone, VAndike 2845.

Subscription rate $3 per year in United States and Mexico; $4 in Canada; $4.50 Foreign Countries. Current copies 10 cents, except special issues; back copies more than two months old 20 cents per copy.

WHY OIL PRICES ARE THE UNSOLVED PROBLEM?

WARREN C. PLATT has just issued a booklet entitled "PETROLEUM PRICES" which discusses why price has been the oil industry's big and unsolved problem.

"Too many oil men seem to think that their so-called 'markets' are some abstract things over which they have no control," says Mr. Platt.

And, in some dozen articles and editorials reprinted from NATIONAL PETROLEUM NEWS, he points the way to a better understanding of *Profitable Price Policies* for the oil industry.

PRICE POLICY for the Oil Industry. . . Just What Is It?

Just how is PRICE arrived at by the many thousands of units selling from refineries and marketing establishments?

Does any one try to determine, by well known and sound accounting computation, his own SALES PRICE?

Does any one ever try to put his price above his neighbor's and competitor's price?

16 FACTORS That Hit Every Marketer's Prices!

Factors—that are increasing profits for some marketers, and making losses for others.

WHY?

Prices Are the Responsibility of Each INDIVIDUAL Oil Man — Not Just of "The Other Fellow".

The purpose of this 24-page booklet is to analyze the oil industry's price difficulties, and to stir more oil men to study and think about this most important problem of the oil industry today—that is, UNPROFITABLE PRICES.

Send for a copy of "PETROLEUM PRICES" booklet, and study it for your own benefit. Price 25c per copy. Lower rates in quantity.

.....CLIP and MAIL TODAY.....

NATIONAL PETROLEUM NEWS
531 Penton Bldg., Cleveland, Ohio

Date.....

Yes—send me copy of the "PETROLEUM PRICES" booklet. Enclosed is 25c per copy. (Lower rates in quantities over 20 copies.)

NAME .....

St.-Box .....

City-State .....

Wage-Hour Division Ducks Ruling on Coal Producers

N. P. N. News Bureau

WASHINGTON, Nov. 27.—The Wage-Hour Division of the Labor Department has handed down a ruling, which, while not directly affecting the status of oil industry employes, might have some bearing on analogous situations within the petroleum industry.

The Division has ruled that employes who make tools, and dies, etc., which do not move in interstate commerce, but which are used in the production of goods for interstate commerce, are subject to provisions of the Wage-Hour Law. But the Division said a coal producer in similar circumstances was a "borderline" case for the courts.

In its interpretative bulletin No. 5 the Division says:

Ruling on Tools

"There are cases, however, where employees producing goods for use entirely within the state of production can be said to be engaged in a 'process or occupation necessary to the production' of other goods which move out of the state of production, and are, therefore, subject to the Act. This would be true of the employees of a tool and die concern which sells all its products within the state for use by a producer of goods for commerce. The legislative history indicates that the Act was intended to apply to employees who make or create tools, dies, patterns, designs, or blueprints, all of which are sold within the state to a local purchaser who uses the tools, dies, patterns, designs, or blueprints in the production of goods which move in interstate commerce."

According to attorneys here, this ruling would make employes engaged in production of oil well supplies and equipment subject to the act, even though the products they make are not shipped outside of the state of manufacture. Its ramifications are broad and there will undoubtedly be a court test before it is universally accepted.

Statement on Coal Producer

In another section of the ruling, the Division states that it is doubtful that a small mine selling all its coal to a local manufacturer engaged in the production of goods for commerce, adding that the case is clearly on the borderline and that it prefers to leave it to the courts. While this section refers specifically to coal, it might possibly be applied to oil under a similar condition.

"A much more doubtful case is the case of the small mine selling all its coal in the state to a local manufacturer engaged in the production of goods for commerce, the manufacturer using the coal to heat his plant or to drive his machinery. Are the employees of the mine engaged in a 'process or occupation necessary to the production' of the manufacturer's goods which move in interstate commerce? We feel that we should refrain from taking any position on a case which we believe to be so clearly poised on the borderline between coverage and non-coverage. We feel that no opinion can be expressed on the meaning of the words 'process or occupation necessary to the production of goods' as applied to a case such as this until the courts have at least indicated the broad outlines of the meaning to be given to this phrase."

Tank Truck Rules Set By North Dakota Body

CLEVELAND, Nov. 21.—The North Dakota Public Utility Commission has prescribed rules and regulations, effective December 1, for tank trucks. The Commission was given authority to prescribe such rules and regulations by the truck law which was enacted at the 1939 session of the state legislature, and which prohibits transportation of more than 1500 gallons without permission of the Utility Commission.

An individual permit for each tank of more than 1500 gallons capacity must be obtained. However, these trucks are limited to 24,000 pounds gross weight for single units and 30,000 pounds for combinations by state law.

Tank trucks are barred from the highways between 6 a.m. Sundays and legal holidays until midnight of the same day. Drivers cannot work more than 10 hours continuously, after which they must have at least eight hours off.

Eighth 'Navy Tanker' Launched

NEW YORK—Standard Oil Co. of New Jersey has announced the launching of the "Esso Richmond," eighth of twelve tankers built to specifications arrived at by agreement between the company and the Navy. It is 533 feet long, will carry 146,000 barrels of oil, and have a speed of at least 18 knots, as against 12 knots or less for the average tanker.

Nathan Bensky Dies

Funeral services were held Nov. 22 at Riverside Chapel, New York City for Nathan Bensky, who built and operated a number of gasoline service stations in New York since 1914. He died at Miami Beach, Fla. Among survivors is a son, Charles J. Bensky, counsel for Gasoline Dealers Chamber of Commerce of New York City.

Helps for Marketers Feature Nebraska Program

N. P. N. News Bureau
CLEVELAND, Nov. 27.—Practical helps for independent oil marketers are featured on the program of the annual convention of the Nebraska Petroleum Marketers, Inc., to be held at the Fontenelle Hotel, Omaha, Dec. 5-7.

Frank S. Henline

Talks of five speakers are pointed at the problems of the independents.

"The Importance of the Independent Marketers to the Industry," will be discussed by Hoyt Ogram, of the Kanotex Refining Co., out of his many years' experience in serving marketers in the middle west.

"Profitable Marketing" will be the subject of a talk by G. Denny Moore of New York, managing director of the Gasoline Pump Manufacturers Association.

"Better Understanding of Oil Marketing," is the subject of Warren C. Platt of Cleveland, editor of NATIONAL PETROLEUM NEWS, scheduled for Dec. 5.

Facts of importance in the administration of the new Nebraska Division of Motor Fuels will be presented Dec. 6 by John Ainlay, chief of the division. "Since the advent of this new division," says Frank S. Henline, secretary of the Nebraska marketers' association, "collection of Port of Entry registration fees on kerosine, tractor fuels, and burning oils have been eliminated through the efforts of our association."

Selling points on high quality motor fuels for fleet owners will be found in a talk to be given Dec. 6 by Arthur F. Johnson, fleet engineer for Ethyl Gasoline Corp., whose subject is, "The Relation of Antiknock Gasoline to Improved Efficiency in Fleet Operations."

"The Need for Solidarity in the Oil Industry," will be discussed Dec. 6 by H. A. Innes Brown of New York, publisher of the "Gasoline Retailer."

Paul H. Engler of Bassett, Rock County Oil Co., president of Nebraska Petroleum Marketers, Inc., will give his talk at the opening luncheon Dec. 5. The annual business meeting and election of new officers will be Dec. 6; three new officers and two new directors are to be elected.

M. I. Dolphin of Omaha, is chairman of the Convention Host Committee; other members are A. W. Anderson of Omaha, Tom Cochran of Kansas City, Tom L. Lambert of Columbus, Ralph Swanson of Omaha.

Paul H. Engler

Wage-Hour Report States Wholesalers Are Under the Law

N. P. N. News Bureau
WASHINGTON, Nov. 27.—Federal wage-hour division has issued a pamphlet directed at employes which declares that workers are covered by the law's minimum wage of 30 cents an hour (with time-and-a-half of the employe's *regular* rate of pay for hours worked in excess of 42 per week) "if you are working for a wholesaler who either receives goods from outside the state or sells them across state lines."

Among exceptions to this state, according to the government pamphlet, are employes who are executives, professional, outside salesman and other classifications (like farm hands) not applying to the oil industry; or workers in a local retail or service establishment.

(Oil company truck drivers, who cross state lines, are apparently subject to provisions of the federal motor carrier law as to hours of service and, as such, are specifically exempted in the wage-hour law itself.)

1939 Meeting of A.P.I. Was Not the Biggest

CLEVELAND, Nov. 27.—John D. Gill, of Philadelphia, head of the economics department of the Atlantic Refining Co., calls NPN's attention to the fact that the registration of 3128 at the recent annual meeting of the American Petroleum Institute was not the highest on record, as was announced at the close of the last meeting.

The sixteenth annual meeting of the institute at Los Angeles in 1935 had an official registration of 3499, Mr. Gill wrote NPN, and was the all-time peak of API annual meeting attendance.

Retail Price Suit Postponed

N. P. N. News Bureau
CLEVELAND, Nov. 27.—Hearing on Gasoline Station Operators Union's petition for an injunction against Standard Oil Co. of Ohio and Shell Oil Co., Inc., for allegedly interferring with retail prices posted by operators of leased stations of defendant companies, has been postponed until Nov. 30 in Common Pleas Court of Cuyahoga (Cleveland) County.

'Gas' Grading Law Drawn Up For District of Columbia

N. P. N. News Bureau
WASHINGTON, Nov. 27.—George M. Roberts, District of Columbia superintendent of Weights and Measures, has revised and brought up to date his bill for gasoline grading in the District, recommending that the D. C. Commissioners ask Congress to pass it at the next session.

In a letter to Chairman Hazen of the District Commissioners, Roberts declared:

"There is not the slightest doubt that misrepresentation, fraud, deception and unfair competition in regard to the quality of motor fuel, gasoline, etc., sold in the District prevail to a considerable extent. This bill is intended to protect consumers by making available to them information about the quality of gasoline and oils they buy and to protect honest business concerns selling motor fuels and oils from grossly unfair competition to which they are now being subjected.

"If this bill becomes a law, the District will have the best and most effective statute on the subject in the United States. The cost of administration will be negligible as compared with the benefits to the public."

Roberts' bill provides that District commissioners set up "reasonable definitions of standards of quality" of gasoline, fuel oils, motor oils, kerosine, and other products. Three grades of gasoline are recommended—"high test, straight, and third-grade."

The standards would be established by the National Bureau of Standards, through "such advice and assistance" as the commissioners may request.

Bill would require that pumps be labeled with the grade established, and would permit a statement of taxes to be included in price signs. All trade names would have to be registered, along with the type of gasoline it was proposed to sell under such name. District officials would also be given the right to take samples wherever and whenever they desired, and measuring devices would be (as at present) subject to checkups.

OIL TAX NEWS

TAXES are so important to ALL oil men, especially taxes levied directly on the oil industry and its products, that N. P. N. each week will devote these columns to news on the subject. Association secretaries, tax committees, other groups and oil men generally are invited to send in news items about taxes—tax proposals, meetings, resolutions, tax bill hearings, rulings, etc. Address Oil Tax News Editor, National Petroleum News, Cleveland, O.

Pressure Seen For Tax Bill

N. P. N. News Bureau

WASHINGTON, Nov. 27.—Despite repeated declarations by Chairman Pat Harrison of the Senate Finance Committee that "we may be able to get by without a tax bill," there will be definite pressure during the regular session of Congress for an increase in income taxes and possibly creation of new levies.

President Roosevelt's Warm Springs statement of last week indicates that the administration has not given up the idea of a special tax of some sort to finance increased national defense expenditures. It is said that the administration is seriously considering a special levy on so-called "windfall" profits which may accrue from European war purchases, with the idea that a tax of this type would serve the dual purpose of checking a possible war boom in this country and at the same time provide the money for the expanded national defense outlays.

Another group within the administration is said to be working on a war profits tax to be supplied only if this country should become involved.

Sen. Harrison has said that he believes the increased revenues from present taxes because of improved business conditions (either because of the war or otherwise), plus "economies" in other governmental expenditures, may obviate the necessity for a broad tax program to finance national defense.

Diversion 'War' Shown on Map

N. P. N. News Bureau

CHICAGO—During the automotive tax conference, held by American Petroleum Industries Committee at Chicago in connection with the 20th annual A.P.I. meeting, a large-scale map was used to show the progress made in the war against use of the motorist's tax dollar for other than highway purposes.

DIVERSION WAR MAP—Cross hatching indicates states with constitutional anti-diversion amendments; diagonal, states initiating amendments; vertical, states which have eliminated or have no diversion; horizontal, reduced diversion; and plain sections, no progress against diversion

Approximately $150,000,000, collected ostensibly for roads, is misappropriated annually by state legislatures for non-highway purposes, according to the A.P.I.C. The people of seven states — California, Colorado, Kansas, Michigan, Minnesota, Missouri and New Hampshire have ratified constitutional amendments (as shown on accompanying map) to guarantee that their legislatures will not misappropriate automotive tax funds. Legislatures of five additional states have initiated steps to submit similar amendments for ratification.

Inspecting the map is U. S. Public Roads Commissioner T. H. MacDonald (left) and Dr. F. G. Crawford, Syracuse University, an authority on the gasoline tax at the right is Peter Schroeder, Minneapolis, chairman of the Minnesota Petroleum Industries Committee and independent oil marketer.

Industry Watches Nebraska, Devonian Well in Salem Pool

TULSA, Nov. 27.—The increasing possibility of new oil production in three widely separated areas continued to hold the attention of the oil industry last week.

Newest and hottest spot was in the heart of the Salem field in Illinois where the Kingwood Oil Co. tapped the Devonian and obtained a good producer. This proof that there is oil in the Devonian in Salem and perhaps in Centralia is expected to start an intensive drilling campaign just as winter comes on.

The field already was producing from three formations—the Benoist, Aux Vases and the McClosky. There also is a possibility that the still deeper St. Louis formation may be productive of oil.

Many oil men are of the opinion that there will be a wave of well deepening in the field, and also that many of the wells in the Centralia townsite area, wells which have just about done all they can do, will be pushed down to the Devonian.

The Forest City Basin area also is holding a part of the limelight as a result of the discovery well near Falls City, Neb., in the southeastern edge of the state. The well, Pawnee Royalty Co.'s No. 1 Boice in Richardson county, (southeastern Nebraska) is reported to be good for around 100 barrels a day and is also said to have proved there is oil in the pre-Mississippean.

Seek $15,000 Prize

State officials have started their official observing and the owners have settled down to a pumping schedule of 50 barrels a day in an effort to keep that rate of production going for 60 days. If the well holds out that long the company will get a $15,000 bonus offered by the state for the first commercial producer in Nebraska.

Several other tests have been started or locations made in the general vicinity of the dsicovery well.

Over in Iowa, meanwhile, the Phillips Petroleum Co. is planning to start a test soon near Creston, in Union county. Several test wells are being drilled at various locations in the Missouri portion of the Basin.

Mississippi is the third area holding attention of oil men and probably is succeeding in holding a greater portion of their attention than the other two.

Yazoo county continues to be the most active spot as a result of the opening of the Tinsley pool, but no major developments were reported during the week. Leasing continued to be extremely active. Estimates place acreage now under lease in various sections of the state at close to five million, with about half that amount already under lease when the wildcat well in Yazoo county began to show indications of being a producer.

Extensive geophysical work is going on in the state at the present time, with reports current that 25 or more crews now were at work.

Ohio 'Gas' Demand Rises 8%

COLUMBUS, O. — Taxable gasoline consumption in Ohio during September was 117,667,239 gallons, up 8.64 per cent over a year ago, Ohio Petroleum Marketers Ass'n., Inc., reports.

Transportation 'Subsidy' Studied

N. P. N. News Bureau

WASHINGTON, Nov. 20.—Interstate Commerce Commission's study of subsidization of highways as compared with other types of transportation, probably will be completed early next year, it was learned today.

First Nebraska Oil Run at Omaha Plant

OMAHA, Nov. 27.—Nebraska's crude oil production and Omaha's first refinery were born together this month, and appropriately enough were brought together to make the first all-Nebraska petroleum products.

By a peculiar coincidence, the first producer brought in in the state was discovered about the time the new 1000-barrel skimming plant erected by the Searle Petroleum Co. was completed at Omaha.

The first batch of Nebraska crude was put through the Searle refinery in a test run November 20. Crude had been brought up from the field by transport truck.

The producer was brought in in the Forest City basin area near Falls City, Nebr., by Pawnee Royalty Co., and is reported to have a potential of around 150 barrels daily of 32 gravity sweet crude. Falls City is in the southeastern corner of Nebraska, about 90 miles south of Omaha, and about ten miles west of the Missouri River and five miles north of the Kansas-Nebraska state line.

The Searle company has contracted to process whatever crude is produced by the Pawnee company in their operations at Falls City. B. G. Guinn of the producing company, and H. A. Searle, Jr., president of the refining company, see the move as the first step in making Omaha the capital for whatever oil may be produced in this area.

Mr. Searle said that the refinery had originally been planned to take care of the company's operations with crudes imported from other states. If the Falls City area proves to be a heavy producer of oil, he added, however, the company will probably be pressed to expand, but there are no definite plans for expansion at present. The refinery is on a 60-acre tract, with room for expansion.

Truck Hauls in First Load

The first tank truck load of Nebraska crude was welcomed into Omaha with a police escort and a band which paraded to the Searle refinery where the oil was to be refined. The company plans to continue to transport the oil by truck for the present, Mr. Searle said, adding, that he had asked the railroads for a "rate" and will use rail transportation if possible. However, if production in the Falls City field permits, the company plans to operate a barge bringing crude up from the field to Omaha on the Missouri River next summer.

The refinery manufactures gasoline, kerosine, light and heavy fuel oils. The latter product will be used by Omaha industries, Mr. Searle said. Important manufacturing interests, he added, have pledged to use this product which is usually the "headache" of oil refineries.

Plans Pipeline to River

There is a pipeline from the refinery to the Illinois Central railroad tracks, and a line will probably be laid to the Missouri River, half a mile away from the plant.

When Mr. Searle announced plans to construct the refinery last summer he proved somewhat prophetic when he said, "If oil is discovered in the Forest City basin of northwestern Missouri, Omaha is the logical refining center for that area." At that time he said that Omaha "will support a refinery and transportation is unequaled."

With a new crude supply—though as yet it is undeveloped and its potentialities undetermined—available to Omaha by cheap water transportation southwestern refiners might be again faced with a problem similar to that brought about by the development in Illinois. Omaha also would have the advantage of shipping to some consuming areas by water.

The Pawnee company is setting up claim to the $15,000 offered by the state of Nebraska as a bonus to the company bringing in the first commercial producing well. To receive the state award, the discovery well will have to produce 50 barrels of crude per day for 60 consecutive days. Second test well of the company is being drilled near Falls City.

Sign Contract for Nebraska Crude

B. G. Guinn, left, co-partner in the Pawnee Royalty Co. which brought in Nebraska's first oil well near Falls City, and H. A. Searle, Jr., president of Searle Petroleum Co., which recently completed Omaha's first refinery, signing a contract to process oil produced by Pawnee in the Falls City field

Socony Hikes Fuel Oils

N. P. N. News Bureau

NEW YORK—Socony-Vacuum Oil Co. has announced that effective Nov. 29, it will advance its tank car and tank wagon prices for kerosine and Nos. 2, 3 and 4 fuel oil 0.1c per gallon generally throughout New York and New England, with the exception of western New York.

High tanker rates from the Gulf were given as the reason for the advance.

More Storage Asked by Navy

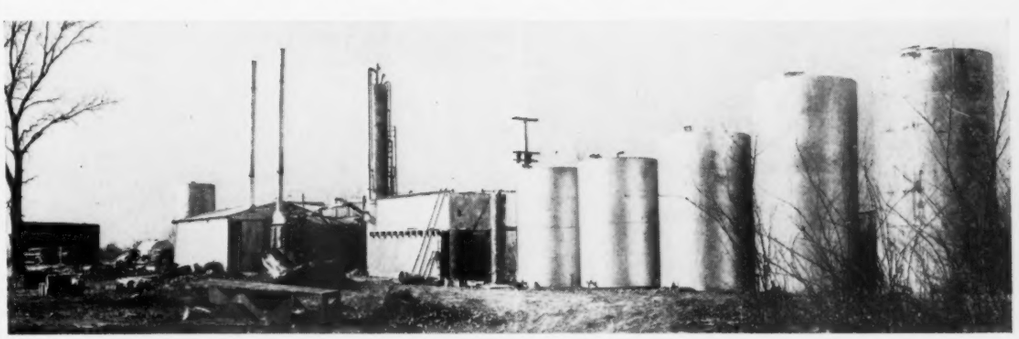
By Teletype
N. P. N. News Bureau

WASHINGTON — Additional naval oil storage facilities are recommended in the annual report of the Secretary of the Navy, although definite information as to location, size and other characteristics was not given. In his report to the President, Acting Secretary Edison said, "Further increases in storage facilities at certain points for fuel oil, diesel oil, and gasoline, both motor and aviation grades, must receive consideration."

Secretary Edison commented that "fuel oil purchases were satisfactory throughout the year and prices were somewhat lower than during the preceding year."

Although the report discusses naval petroleum reserves at some length, there is no mention of acquisition of Tidelands.

Omaha Refinery Processes First Nebraska Crude



Omaha's first refinery, a 1000-barrel skimming plant, built and operated by Searle Petroleum Co., was intended to run on crude "imported" from other states. However, a producing well was brought in near Falls City, Nebraska, about 90 miles south of Omaha, just about the time the refinery was to go on stream

The Editor's Page

Readers Comments and Opinions will be much appreciated by—
Warren C. Platt
Editor and Publisher
Penton Bldg., Cleveland, Ohio

Thank Pennsylvania, Also

For Lowering All Fire Insurance Rates

In all these years this mutual company found itself leading in setting high standards of fire protection. Many a time it turned down risks that the stock companies gobbled up to their sorrow. This mutual saw these stock company interests, finally, quite solicitous of aiding the oil industry to get better fire protection.

For more than a score of years the oil industry everywhere has been enjoying quite reasonable fire insurance rates from all companies. And in that score of years there has developed a campaign of education for better standards and construction in the industry that have each year reduced still more the fire hazard.

The other day this still relatively small mutual company, the National Petroleum Mutual Fire Insurance Co., consolidated with the larger Western Millers Mutual Fire Insurance Co. of Kansas City. Houston Dunn and a few oil men as advisors, will continue the strictly oil end of the business, at Philadelphia through the agency of the National Petroleum Underwriters. The consolidation will permit of the company carrying still more business from oil and will give it many other advantages in getting business and servicing its oil customers.

But it fairly can be said that the primary reason for the organization of this mutual has long since been attained, that of lower rates by actual and fearless competition, and the education for better fire risks in the oil industry. The National Petroleum Mutual Fire Insurance Company has saved the oil industry a great many millions of dollars in making this fight and it has been a strong educational influence for better construction at oil plants. It is one of those big milestones on the road of progress of American business men.

The oil industry from coast to coast is again indebted to the Independent refiners of Pennsylvania and other Independent oil men who later joined, in creating and managing so well this example of free competition against insurance companies that had grown too lordly and calloused to their customers interest. And the industry also owes a debt to the manager of this crusading enterprise Houston Dunn of Philadelphia. He has been its father and boss all these years, and he is still taking business for the new company at the old stand in Philadelphia.

There is a moral to be drawn by the oil industry from this history of this mutual fire insurance company.

The oil industry's insurance company was a finger that pointed to a weakness in the rate set up and business methods of the old stock fire insurance companies. The first "co-ops" in oil pointed a similar finger to the industry's then "long" margins which had come through perfectly justified causes. The industry might well consider the growth of today's "price selling" competition as a finger pointed at uneconomic methods that tarry too long in industry practice. These methods, of which the industry is well acquainted, are of yesterday. They were highly efficient "yesterday" but they are being crowded out, by more direct handling of petroleum products, in the larger quantities by cheaper transportation methods and sold through still more modern equipment at service station and in quantities to other and large consumers.

The 30 years span of the National Petroleum Mutual Fire Insurance Co., is from the era of bad fire risks, high premiums and small policies, to today's safety period of little fire risk, low premiums and big policies. It also is the span of the industry's change from the day of a small volume of gallons delivered in horse drawn tankwagons from small bulk plants, to large gallonage volume delivered by low cost transportation and large outlets to consumers, many of whom come and carry it away and pay less for it even with excessive taxes, than at the beginning of this era.

The fingers, undoubtedly, are pointing the way down the new road.

Inefficiency Invites its own Cure

One of the outstanding features of our American competitive freedom has been that when men felt themselves unjustly used they could band together in self defense against their conception of the evils that arise from the system.

There have been many illustrations of this in the oil industry. Several of our larger oil companies resulted directly from such defensive organizations. Associations have also been formed for the same reason.

Probably, in oil, the western Pennsylvania producing and refining region has been the birthplace of more such defensive organizations than any other oil section of the country, in fact probably more than all other oil areas combined. Whenever a need arose, there generally could be found in this region a group of men willing to put up the money and time to make the fight. From those fights have come not only several of our larger oil companies, but a new set of oil freight rates the country over, an Interstate Commerce Act that gave the Interstate Commerce Commission real power, the anti-discrimination law, the first effort to successfully oppose mounting oil and later gasoline "inspection" fees, a common carrier pipeline law and the U. S. Supreme court decision to back it up, and others.

So it was but natural that more than 30 years ago the Independent refiners of western Pennsylvania, in between oil industry fights, looked at the fire insurance rates handed them by the stock insurance companies and decided that it was time to knock those rates down by introducing some competition. So they listened to the plan of a young insurance engineer, Houston Dunn, and started the National Petroleum Mutual Fire Insurance Co. They subscribed to some insurance, paid up the premiums to provide capital, rented a room in Philadelphia wherein they put Mr. Dunn and started

as interesting an illustration of the freedom of our American competitive system as there is.

When this small effort started back in 1908 the Pennsylvania refiners were paying something like $5 per hundred for their insurance. Their pleas for even consideration of a reduction were ignored by the old line stock companies. The companies' representatives would not make any suggestions for reducing fire risks or look at what the refiners themselves had done to cut down the fire hazards which were bad in the early days.

Within a few months the stock fire insurance companies decided maybe there was something to this small effort and began reducing their rates, at the same time getting out their hammers to knock the company. That was, as is usual when companies have grown away from intimate contact with their customers, the very thing to boost the new competition. The little insurance company grew and the rates went down.

The irony of it also was that in later years the small mutual insurance company saw these same stock companies who had called it a "rate cutter" get into rate fights and send oil rates way down past any reasonable figure the mutual could or would meet. This little company also saw one of the largest of the stock companies get into financial difficulties partly because of its ruinously low oil rates.

A Party Comes to Frank Phillips On His '66' Birthday

The countryside, the Southwest and a good bit of the oil industry are turning out this week to a birthday party at Bartlesville, Okla., Nov. 28th was the 66th birthday of Frank Phillips, builder of the Phillips Petroleum Co., of Bartlesville, the Southwest and contributor of much of the oil industry's progress.

The employes are giving Mr. Phillips the party. It is a big one, with parades and bands and games and speeches and all else that a generous and warm-hearted western oil crowd can bring to the man who built a big business that stretches over a big part of the west and the north and east as well.

If you want to know what kind of a birthday present such a party is, just imagine yourself, Dear Reader, in Frank Phillips' shoes as he mills around among the thousands in that town to which he came more than 40 years ago. You will live all those years as you mix around, listening to the words and cheers of your friends. Every building of that town will once again grow before your mind's eye and the business fights you had will be recalled by this and the other old employe you encounter.

It will be your memories that will build this party into the best birthday gift of all. There are not enough gold watches, or silver tea services or automobiles made to take the place of such a crowd of your own people for whom, you, the figurative Mr. Phillips, have created jobs and comfortable incomes and happiness and real living.

Mr. Phillips is no longer the lonesome young man who hopped off the train that dusty day years and years back, looking for opportunity and friends. This birthday party told him all these 40 years were very much worthwhile.

Would that all "big business" men could have parties. The gap between "big business" and the rank and file would not be so great and there would be far more understanding.

May Frank Phillips enjoy many another such "homecoming."

Frank Phillips

Alky-Gas Research Goes Scientific

The movement to inflict alcohol-gasoline as a motor fuel on the middle west by government fiat and regardless of its economic and mechanical value, has evidently failed.

Now comes the Department of Agriculture with announcement of the inauguration of some scientific research, not only of whether a mixture of alcohol and gasoline can be made to work well in an engine, but how to raise and handle economically the farm products from which alcohol has to be made. Also to study the impact of such a fuel on the oil industry. As outlined by the announcement of Secretary of Agriculture Wallace, the study will be intelligent and thorough.

No oil man will object to any such research nor will he object, when the time should come, if it does ever come, that a better motor fuel can be made cheaper from something other than petroleum. Producing crude is only a part of the oil industry. The rest of the industry is not tied irrevocably to the products of crude oil. The refiners can and undoubtedly will make the cheapest and best motor fuel and lube oil possible, regardless of the raw material, while the marketers will sell that fuel, whatever it may be, just as efficiently as they now sell gasoline.

Oil refiners have long been doing special things to the molecules they get from crude oil to make them do a better job in the engine. Refiners have been tinkering with each molecule, adding to each and taking from each. The oil industry's scientists have even gone out to sea and drawn an infinitesimal molecule from seawater to add to motor fuel to make it do a better job as Ethylized gasoline.

Oil industry scientists have long had worked out practicable methods of getting motor fuel from oil shale and coal. They also have done much work with molecules obtained from what grows on top of the ground. While the automobile engineers and the oil industry's scientists may not know all there is to know about motor fuels, it should be a fair conclusion from all the millions of dollars that these two groups have spent on fuel research, that when a better and cheaper motor fuel can be made from what grows on top of the ground, they will be the first to demand and create that fuel.

It is to be sincerely hoped that Secretary of Agriculture Wallace keeps his investigations of alky-gas in the realm of science and out of the realm of politics and stock promotion. If so, he can aid the automobile and motor fuel industries in their service to the consuming public.

Oil Transportation News

Latest developments in freight rates, legislation, regulations, and new construction affecting transportation of petroleum products by truck, barge, tanker, pipeline, and railroad.

Army Interested in Campaign For Uniform Sizes, Weights

N. P. N. News Bureau

WASHINGTON, Nov. 27. — War Department officials are definitely interested in promulgation of federal regulations governing sizes and weights of trucks on U. S. highways, it was learned today.

They are working with officials of American Trucking Associations, Inc., toward the end that such regulations be promulgated, thus eliminating the hodge-podge of state size-and-weight regulations now existent.

Charles P. Clark, of Columbia Terminals, St. Louis, Mo., plans to be in Washington next week for a meeting of the executive committee of ATA, and at that time will confer with War Department officials on the possibility of getting the ICC to hurry along its proposed federal regulations to supersede the conflicting state regulations.

Mr. Clark, a lieutenant colonel in the Officers Reserve Corps, is chairman of ATA's size-and-weight committee.

Objective of the War Department's interest in uniformity of truck sizes and weights, it is understood, is in making plans for use of trucks in wartime—either in defense of this country or elsewhere. By knowing a more or less uniform capacity for trucks, tank and otherwise, the war planners would be enabled to know just how many vehicles would be required to move a certain volume of commodities from one place to another, and similar definite planning would be facilitated.

It is understood that the department is particularly interested in service of mechanized units of the army by tank trucks which are able to move right up behind the lines in supply trains, and in calculating their capacity and serviceability.

Federal Agency Maps War On State Trade Barriers

N. P. N. News Bureau

WASHINGTON, Nov. 27. — After its long period of apathy toward "border barriers," the federal government may do something about these restrictions to interstate commerce which hamper the free flow of goods between states.

In letters to the heads of the State, Labor, Agriculture, and Justice departments, the Federal Works Agency and National Resources Committee, Commerce Secretary Hopkins has asked for appointment of an inter-departmental committee to co-ordinate government activities for combatting the laws and regulations against which highway users, truck owners and private organizations have waged a fight since their inception—such as port-of-entry laws, taxes on out-of-state trucks and products, inspection laws, etc.

Following the formation of the committee, the Temporary National Economic (Monopoly) Committee will be asked to hold hearings to consider the effect on the national economy of state laws which set up these border barriers.

In his letter, Secretary Hopkins said:

"For several years a number of government agencies have been giving attention to the problem of the increasing barriers to interstate trade. I have been concerned about the growth of these barriers and have had our division of industrial economics working on the problem. However, it would seem that the government might function more effectively if the various interested agencies were to join forces or at least coordinate their efforts. I, therefore, propose to set up an informal interdepartmental committee for this purpose."

Shreveport Plants Seek Lower Rates Into Texas

DALLAS, Tex., Nov. 27.—Shreveport, La. refiners have asked the Texas-Louisiana Freight Bureau to publish petroleum rail rates from their plants to Texas destinations that are on a parity with Texas intrastate rates. The shippers suggest parity may be attained by eliminating the 10 per cent increase in interstate rates ordered by the Interstate Commerce Commission in its Ex Parte 123.

The proposal, which affects only refined gasoline and kerosine, will be heard by the freight bureau Dec. 5.

Colorado Rates To be Slashed

TULSA, Nov. 27.—Petroleum product shipments by rail into Colorado from central Kansas and northern Oklahoma refineries will be reduced as much as 19 cents per hundredweight (1.25 cents per gallon on gasoline) January 1.

Reduced rate scale from central Kansas to Colorado will apply to shipments on all lines serving that group. Rock Island and the Santa Fe are the only lines so far that have filed notice of placing shipments from northern Oklahoma origin points on the same basis as those from central Kansas.

Present rates and reduced rates in effect January 1 from central Kansas and northern Oklahoma to representative Colorado destinations are shown below in cents per gallon of light oil shipped:

To	Present	Proposed
Trinidad	3.366	2.112
Pueblo	3.366	2.112
Colorado Springs	3.366	2.244
Denver	3.366	2.442

'Still Not Drastic Enough'

Some marketers who truck gasoline from Mid-Continent refineries to Colorado have indicated to their supply sources they would be willing to ship by rail even though cost was 0.25 to 0.50 cent a gallon above present truck costs. This sacrifice in transportation costs, they have said, would be in the interest of "market stability." But proposed rail rates, according to shippers, are not drastic enough to wean much business from the trucks.

Southwestern Freight Bureau has been working out a differential basis above central Kansas rates for shipments from other Oklahoma and Texas origin points. No announcement has been made yet on their findings.

Rails Announce Cut In Southwest Rates To River Crossings

ST. LOUIS, Nov. 27.—Failing to obtain reduced through rates on petroleum products moving by rail into the Southeast, Mid-Continent refiners now have a chance of obtaining the next best thing—a rate cut as far as Mississippi river crossings.

Missouri Pacific and Rock Island railroads have given notice of their intention of reducing rates to Mississippi river crossings, on shipments from points along their lines, by approximately 8.5 cents per hundredweight (0.561 cent per gallon reduction in gasoline rates). New rates would be 5.5 cents per hundredweight below those in effect on Nov. 14, 1937.

Several other southwestern lines were expected to concur in the reductions from Mid-Continent refining points to the river, but there was little hope that railroads east of the river would concur. Southeastern lines have repeatedly opposed proposals for reduced through rates from southwestern refining points.

ICC Calendar On Oil Trucking

DECISIONS

R. C. Fearnow & Sons, Pueblo, Colo. Applications denied for a permit to operate as a common carrier of petroleum products from points in Kans. and Okla. to points in Colo.

Hutchinson Transportation Co., Los Angeles, Calif. Extension of operations as common carrier of petroleum products and machinery between all points in Calif., Ariz., Nev., and New Mex., certificate denied.

Casey Jones, Denver, Colo. Decision as of Jan. 24, denying applicant permit to extend operations as a common carrier of refined petroleum products from points in Kansas to Colorado points, reconsidered and certificate granted.

Petroleum Transportation Co., Seattle, Wash. Extension of operations as a common carrier of petroleum products in tank trucks from The Dalles and Umatilla, Ore., and Attalia, Wash., to points in Idaho and Wash. over irregular routes, certificate granted.

National Oil Co., Boston, Mass. Application for a permit to operate as a contract carrier of petroleum products from Providence, R. I. to points within radius of 30 miles of Boston, and from Danversport,

Mass., to points in New Hampshire over irregular routes, denied.

Cumberland Motor Express Corp., Cumberland, Md. Application denied for a permit to extend operations as a common carrier of petroleum products from East Freedom, Pa., to certain points in Md., and W. Va.

HEARINGS

Partington's Garage and Truck Line, Billings, Mont. Dec. 1, Billings, on application to extend operations as a contract carrier of petroleum products in Montana and Wyo., and also on application to extend operations as a contract carrier of petroleum products in Wyo. and Mont., between Clark, Wyo., and points located within 15 miles thereof, and Billings, Mont.

Saxton J. Hayes, North Grafton, Mass. Dec. 2, Boston, on contract carrier application to transport petroleum products in Mass. and R. I. over irregular and regular routes.

G & C Transportation Co., Webster, Mass. Dec. 4, Boston, on common carrier application to transport petroleum products in Mass., Conn. and R. I.

McCarthy's Express Co., Lawrence, Mass. Dec. 5, Boston, on application to extend operations as a common carrier of petroleum products in Mass. and N. Hamp.

RAIL RATE BRIEFS

N. P. N. News Bureau

WASHINGTON, Nov. 27.—Minneapolis and St. Louis railway has filed with Interstate Commerce Commission tariffs publishing reduced rates on petroleum products from Des Moines, Burlington, Council Bluffs, Davenport, Iowa City, and other Iowa points, and Omaha, Nebr., to stations in Iowa, Minneapolis, and South Dakota, to meet motor truck competition.

The new rates are applicable over a number of connecting lines. Also there are a number of small increases in the "motor compelled" rates, that represent, for the most part, cuts of from three to six or seven cents per 100 pounds (0.198 cent to 0.396 cent per gallon on gasoline).

Texas May Liberalize Load Limit on Trucks

AUSTIN, Tex., Nov. 27.—Possibility that Texas might raise its load limit for trucks operating intrastate was voiced here last week by Texas Railroad Commissioner E. O. Thompson. Action by Texas railroads in obtaining temporary injunction against enforcement of the commission's order abolishing freight rate differentials in the state "will awaken the people to the necessity of raising the load limit on trucks," the Colonel said. (The Texas limit on trucks is 7000 pounds except for trucks hauling to and from railroad stations.)

The rails "can't enjoin progress," the commissioner stated, adding that while the rails were litigating and lamenting loss of business, trucks and planes were passing them by.

Truckers are abiding by the differential order, which was said to deprive Texas carriers of about 15 per cent of their revenue from the differential territories.

Gasoline Trades Cut Tonnage of Pipelines

(*Continued from page 5*)

marketing territory gradually nearer its refineries.

It will be noted that Phillips Petroleum Co. is a stockholder in the Great Lakes line, but now Phillips has a line of its own from St. Louis to Chicago, and accordingly will not need to shuttle gasoline from its trunk line at the Paola, Kan. station to the Great Lakes line's terminal at Kansas City for movement to Chicago. That naturally will cut down the amount of material to be tendered the Great Lakes line by Phillips in the future.

Trades Worked Out

One or two members of the Great Lakes group are understood to have shipped by rail from Chicago to their distribution points in both Illinois and Indiana but since the Shell Pipe Line Co. has placed its gasoline line into operation several trades have been worked out which naturally checks the rail haul from Chicago.

Several other gasoline trades probably have been made in the year between member companies of the Great Lakes and non-member refiners, and some of these trades undoubtedly have cut down the amount of volume of gasoline the member company has tendered to the Great Lakes system.

Then there are the marine terminals that have been developed on the upper Mississippi river, and the improving of the Illinois River so that barges now can reach the Mississippi from the Chicago refining district, or move to Chicago from the lower reaches of the river.

By refefring once more to accompanying table 1 it will be noted that four of the eight shareholders in the Great Lakes system have refineries almost within a stone's throw of the new Illinois field.

Refineries Near Illinois Field

Pure Oil Co., with a refinery at Chicago, was one of the major producers in the Illinois field. Pure has shut down its Muskogee, Okla. refinery, at the southern end of the Great Lakes line, and has been concentrating on processing Illinois crude. That naturally took some business from the Great Lakes line.

The Texas Co. is another of the major producers in Illinois. It has refineries at Lawrenceville, Ind. and Lockport, Ill. both of which have been operating quite extensively on Illinois oil, and getting the products to markets with comparative ease.

Cities Service Oil Co. and Sinclair Refining Co. each have a refinery at East Chicago. These companies also have had experience with the Illinois crude.

Then there is the matter of the new refineries in Illinois and those in adjacent states whose products have cut into the market of the Great Lakes group. Much of the distribution from these plants has been by transport truck.

The Great Lakes members once reached well into Michigan but since the development of both crude resources and refining capacity, along with the marine terminals, no Great Lakes member is now shipping into Michigan, according to reports available here.

It can be seen from these various factors, therefore, that with the little bit of business lost here by some members and the little bit there by other members of the Great Lakes system that the total loss amounts to a rather sizeable figure.

Further Loss in 1940 Seen

Now as to the prospects for further loss of tonnage in 1940, it should be kept in mind that the Cimarron Valley line is being extended across Nebraska and to Rock Rapids, Iowa. That will give the Great Lakes members competition in a good portion of northern Iowa, and the eastern half of South Dakota and a good portion of the Southern half of Minnesota. And finally there is that Illinois oil once more to be considered.

The discovery of a fourth producing horizon in the Salem field, the most prolific of the new pools in the state, is expected by many observers to keep Illinois production well above 300,000 barrels daily next year. There are some predictions that if the production in the Devonian horizon is fairly widespread, that the state will have a daily production before the end of next year of around 400,000 barrels.

Ownership of Great Lakes Line

Members of the Great Lakes Pipeline Co. and percentage of stock ownership at the present time.

Refiner	% of Stock Owned
Continental Oil Co.	29.18
Mid-Continent Petroleum Corp.	18.96
Skelly Oil Co.	14.22
The Texas Co.	12.14
The Pure Oil Co.	9.48
Sinclair Refining Co.	5.88
Cities Service Oil Co.	5.15
Phillips Petroleum Co.	4.99
TOTAL	100.00

Truck Movements Rise Sharply

N. P. N. News Bureau

WASHINGTON, Nov. 27—Truck movement of petroleum products participated in the general increase in truck tonnage moved in October which American Trucking Associations, Inc., attributed to the general business upswing.

Petroleum tonnage moved by truck in October was 24.8 per cent greater than in the same month last year, although somewhat lower than in September, a seasonal decline.

Movement of commodities generally by truck in October was 4.5 per cent above September (and established a new all-time "high" for the third consecutive month), 25.6 per cent above October a year ago, and 51.3 per cent above the monthly average for 1936.

October Oil Exports are Up $4,000,000

N. P. N. News Bureau

WASHINGTON, Nov. 27.—October exports of petroleum and products from the United States amounted to $36,000,000, compared with $32,200,000 in October, 1938, Commerce Department reports. Despite this increase, however, 10-months exports this year amounted to $317,000,000, compared with $326,400,000 in the same period a year ago.

A tabulation of exports of crude oil and principal products follows:

	October		First 10 months	
	1938	1939	1938	1939
Crude oil				
($1,000)	9,568	9,011	97,423	80,054
(1,000 bbl.)	6,780	6,947	66,768	62,085
Gas and fuel oil				
($1,000)	3,286	4,630	47,345	46,911
(1,000 bbl.)	2,916	3,784	36,645	39,607
Motor fuel				
($1,000)	8,452	8,493	83,749	80,558
(1,000 bbl.)	3,325	2,729	32,758	31,499
Lubricating oil				
($1,000)	5,855	8,588	58,198	68,616
(1,000 bbl.)	708	972	7,967	9,379

Public Relations Program On Value of Trucks, Urged

By Telegraph

OKLAHOMA CITY, Nov. 28. —A public relations program that will establish truck drivers as "gentlemen of the road" was advocated by Ted V. Rodgers, Washington, D. C., president of American Trucking Association, at the opening of the annual meeting here of the Associated Motor Carriers of Oklahoma, Nov. 24.

A.T.A.'s plan for educating the public on the importance of trucking in the economic picture was outlined by the A.T.A. president, who urged that Oklahoma carriers shoulder part of the responsibility of carrying out this public relations program.

The importance of trucking in Oklahoma was stressed by Moss Patterson of Oklahoma City, newly elected president of the A.M.C.O., when he cited that more than 400 Oklahoma cities depend on truck transportation as their only means of public transportation.

The Interstate Commerce Commission's attitude in truck regulation was voiced by Ray G. Atherton of Little Rock, district director of the motor carrier division of the ICC, when he stated "we're going to try to stay away from the distasteful part of our enforcement jobs and give more thought to helpful regulation. But we are hired to do a good enforcement job too. Those who won't play ball will just have to pay for it."

Roy L. Williams of Enid, R. L. Williams Tank Line, was elected chairman of the Petroleum Transporters Division of A.M.C.O. In addition to Williams, R. J. Allison of Tulsa, H. L. McKee of Enid, Henry Adams of Shawnee, Earl Bray of Cushing and L. V. Hopkins of Ponca City, were elected directors of the petroleum transporters division. Mr. Williams had been acting as temporary chairman of the group since it was organized.

Oklahoma Drafts 'Gas' Specs.

By Telegraph

OKLAHOMA CITY, Nov. 27. —Regulations for the marketing of petroleum products under graded standards of quality, as authorized by Oklahoma's recently - amended oil and gas inspection law, are being formulated by the Oklahoma Corporation Commission.

Several conferences and hearings with Oklahoma refiners and marketers have already been held. Hearings on proposed motor fuel specifications will be held here December 6 at the commission offices.

Standards under consideration include three octane brackets, with regulations as to coloring. Premium grade would be colored red and include gasoline with an octane rating of 76 and above by the CFR motor method (ASTM) test. Regular grade would have to test 68 octane or higher and could be tinted any color except red. Below 68 octane gasoline would be tinted any color except red or bronze. Other specifications are to be set up.

December Quota Set

N. P. N. News Bureau

TULSA, Nov. 27. — Texas Railroad Commission has revised its list of shutdown dates in December to enable Texas oil wells to be shut down on Christmas. The Texas allowable for December is expected to average 1,386,439 barrels daily as a result of 12 production holidays.

December production allowable for Oklahoma was upped 8600 barrels daily to 437,600 barrels daily, same as the Bureau of Mines market demand forecast.

Louisiana's production average will be pinched in 3796 barrels daily in December, to 255,200 barrels.

Kansas operators have been producing their wells on the basis of the Kansas Corporation Commission's October order. Since there is no word from the Commission to the contrary, December production probably will continue unchanged.

All allowables are within the Bureau's demand forecast.

Socony Association Wins

WASHINGTON — Socony-Vacuum Tanker Officers Ass'n. has been certified as sole collective bargaining agency for licensed engineers and deck officers on vessels of Socony-Vacuum Oil Co., National Labor Relations Board announces.

WARREN, Pa.—United Refining Co. has started shipping from the Sloan and Zook refinery here which it purchased and put on stream several weeks ago.

Private Truck Hearings Open

By Teletype
N. P. N. News Bureau

WASHINGTON, Nov. 28. — Representatives of private truckers opened their argument against being made subject to Interstate Commerce Commission "safety" regulations here today. They attacked findings of the ICC examiner who held a series of hearings early this year and recommended that the commission find a "need" for such regulations.

Private carrier representatives pointed to the safety record of private trucks, and to the testimony at the hearings that they were considered a better insurance risk than for-hire vehicles.

There were no representatives of petroleum companies or associations listed among those scheduled to appear, although the private carriers council has a number of petroleum company members.

Mid-Continent Lube Exports Jump 144% in October

N. P. N. News Bureau

TULSA, Nov. 27. — Export shipments of bright stock by 12 Mid-Continent refiners jumped to 81,948 barrels in October, 144 per cent above September export, Western Petroleum Refiners Ass'n. reports.

Inventory of bright stock on hand at these refineries Oct. 31 of this year totalled 196,687 barrels, off 82,003 barrels from inventory at the end of the previous month, and down 159,888 barrels from stocks of this product on hand at the end of October last year.

Stocks of viscous neutrals, paraffin oils, and steam refined stocks at these plants, on Oct. 31 of this year all were lower than inventory at the end of the same month last year. Stocks of blended oils, however, were 10,953 barrels higher this year than last.

Price Posting Law Upheld In Massachusetts

BOSTON, Nov. 27. — The Massachusetts supreme court has upheld the state price posting law of 1939 requiring, in part, that gasoline retailers mark their pumps "conspicuously" with the price of the fuel dispensed from the pump, but that such signs shall not exceed 8 by 10 inches. Decision was in the case of Slome vs. City of Fitchburg.

Gasoline price signs are limited to those on the pump, and the plaintiff asked that this section of the law be declared unconstitutional. The court stated it found nothing "savoring of discrimination or arbitrary action."

Railroad Heads Get Subpoenas

By Teletype

WASHINGTON — First summonses have been served in the Justice Department's anti-trust suit charging association of American railroads and its members with entering into agreements not to extend to motor carriers the same co-operation they ordinarily extend to each other (NPN, Nov. 1, page 14).

They went to executives of 12 middle western and western railroads, among them Ralph Budd, president of the Burlington, E. M. Durham, Jr., chief executive officer of the Rock Island, Edward J. Engel, president of the Santa Fe, H. A. Scandrett, president of the Milwaukee, H. D. Pettibone, trustee of the Monon, Walter J. Cummings and George I. Haight, trustees of the Milwaukee, F. O. Lowden, James Gorman and Joseph B. Fleming, trustees of the Rock Island, Benjamin Wham, trustee of the C & E I., and Charles M. Thomson, trustee of The North Western.

The civil suit against the rails is filed in the federal district court for the District of Columbia here.

Navy Praises Oil's Research

N. P. N. News Bureau

WASHINGTON, Nov. 28. — Report of Admiral Towers, chief of the Navy Bureau of Aeronautics praises the co-operation of the oil industry in the development of higher octane and improved performance of fuels. The report states:

"Increasing the octane rating or resistance to detonation of aviation fuels has resulted in improved performance through greater fuel economy and increased power outputs. The development is the result of long range planning in co-operation with the air corps and the industry. A reduction in the number of fuels and lubricants has also been accomplished through standardization, permitting a substantial reduction in stocks for military purposes that need to be carried by refineries."

Stanolind's Pipeline Valued

WASHINGTON — Interstate Commerce Commission has tentatively valued owned-and-used properties of Stanolind Pipe Line Co. (Indiana Standard) at $66,580,924.

Around THE MID-CONTINENT

. . . By ALLEN S. JAMES

TULSA, Nov. 25

Only 12 years ago when Phillips Petroleum Co. first entered the retail marketing end of the oil business a motor fuel with a gravity of 60-62 was considered pretty good.

Phillips stepped its regular grade up to around 66 gravity and branded it "Phillips 66."

That brand now is known throughout the major portion of the middlewest, some of the central and much of the southwestern parts of the United States.

Now along comes Frank Phillips, founder of the company and its president until a short time ago when he became chairman of the board, with his 66th birthday on Nov. 28.

That was too good an opportunity to let pass.

So the Phillips employes and the citizens of Bartlesville, Okla., the city Frank Phillips was so instrumental in building and the place where everyone calls him "Uncle Frank" decided to throw one whale of a birthday party.

The "Frank Phillips 66 Special" was scheduled to bring scores of employes and friends from the Texas Panhandle, while another special train of employes and friends was coming from Kansas City and more distant points.

A mammoth parade consisting of 66 units, divided into three sections, was only one of the features on the program, depicting with a series of floats, the life history of Frank Phillips from his birth in an Iowa cabin in 1873 until he moved to Bartlesville in 1903.

Other features on the program included: An aerial bomb salute of 66 bombs was the signal for the air exhibition at the Phillips airport; a drill team of 66 service men from Tulsa stepped through some clever maneuvers.

Sight-seeing tours were to include the Phillips research building, the U. S. Bureau of Mines experimental station, and the famous Woolaroc ranch where Frank Phillips is developing one of the country's most interesting historical museums.

"Uncle Frank" was to be presented with a birthday greeting from his employes, the greeting being a huge birthday cake which was an exact replica of the Phillips building in Bartlesville.

What a birthday party!

And to think it might never have happened had an official of the company not been so stubborn back there 12 years ago. He wanted to call the new motor fuel "Phillips 66." He was overruled and the name "New Natural" hung on it. But this official went ahead, after trying out the new name a few days, and on his own initiative changed it to "Phillips 66."

Two Thanksgivings in Texas

The oil companies didn't get together on the matter of Thanksgiving observance in Dallas and Fort Worth this year.

A majority of the companies in Dallas took the day off on Nov. 23. Only one large company in Fort Worth shut up shop that day.

But next Thursday is a different story. Fort Worth companies will close while Dallas companies will be counting the days until the Christmas holiday.

Texas Observes Christmas

And speaking of Christmas, the Texas railroad commission hastened the past week to correct a tactical error in its December proration order. The commission had scheduled 12 shutdown days during the month—the five Saturdays and the five Sundays and Dec. 1 and Dec. 15—but had left Dec. 25 on the calendar as a producing day.

Now the commission has corrected its original order by substituting Christmas day for Dec. 15 on the shutdown list.

Base of Public Relations Is Contact with Employes

N. P. N. News Bureau

CHICAGO, Nov. 25.—The importance of sound relations between the oil companies and their three-quarter million employes, in fostering any general public relations program of the whole oil industry, was presented by H. H. Anderson of St. Louis, Shell Oil Co., at the group session Nov. 16 on Public Relations at the American Petroleum Institute convention.

At the same session, W. D. Humphrey of Findlay, O., representative of the Ohio Oil Co., speaking on "Helpful Petroleum", outlined the many ways in which petroleum products contribute to the needs of modern civilization, in fact, have made possible the type of civilization we have today.

A third speaker, H. K. Boice of New York, of the advertising firm of Benton and Bowles, Inc., discussed methods by which oil companies, in connection with their advertising of their products and their services, could also carry to the public something of this story of what petroleum has done to benefit mankind.

"We must recognize that the tongue of good report among employes is one of industry's finest assets," said Mr. Anderson, speaking on the topic, "Petroleum's Good-Will Ambassadors." The petroleum industry, he said, has nearly three-quarter million employes, counting those of dealers, each of whom is either an active or potential ambassador of good will.

"Employes are the agents or intermediaries through which customers are dealt with indirectly," he stated. "It is obvious, therefore, that the building of good will among them must precede the building of good will among those whom they contact. This holds just as true in a dealer's service station, with its one or two employes, as it does in the integrated company with its several thousand."

The employes of oil companies have a vital stake in this program to build public good will, Mr. Anderson stated, since their employing company is directly and adversely affected by detrimental publicity and legislation. Their means of livelihood and their continuity and regularity of employment are threatened by unwarranted slander, confiscatory taxation and attempts to divorce the various industry branches of the oil industry, he brought out.

"Even though a dealer may be unhapy about the treatment he has received from his wholesale supplier", said the speaker, "he will be well advised to confine his complaint to the supplier and to his local association. If he complains to his customers and neighbors, he will create only suspicion, mistrust and ill will in the minds of a group who can do nothing to help correct the complained-of conditions. And the reaction from the unfavorable public opinion thus created will prove detrimental to the ultimate best interest not only of the industry but also of the dealer himself."

Mr. Anderson presented the following five steps as necessary for the oil company to follow in developing sound employe relations:

Five-Point Program

"1. Recognition of employees as constituting a public entitled to sincere, fair, and considerate treatment.

"2. Development of a sound program of provisions and policies respecting employment.

"3. Promulgation of these provisions and policies to assure common understanding by the entire personnel.

"4. Training of supervisory staff to carry out this program in the spirit which characterized its development.

"5. Dissemination among the entire personnel of pertinent information as to the aims, history, operations, and accomplishments both of the company and of the industry."

Talks of Oil and Tomorrow

"Directly and indirectly, petroleum has established itself as the base of modern living today," said Mr. Humphrey after describing the various ways in which many oil products serve the present social order. "That modern civilization has its defects is true, but that its compensations are also great is likewise true. More important still, the fact that the possibilities for the 'World of Tomorrow' are as great, if not greater, for a further spread of advantages to the masses of our people.

"Many of these possibilities are already visualized by petroleum technologists. One thing is certain; that whatever beneficial changes come in material civilization, they will come in part because of petroleum and its products."

'Ad' Man Discusses Copy

It is not necessary for the oil company to set aside part of its advertising appropriation for public relations copy as such, Advertising Counsellor Boice told his audience. Oil company advertising copy can do a good public relations job also, if the following points are borne in mind, he said:

"1. Don't consider your advertising and your public relations as separate and distinct.

"2. Scrutinize each advertisement with the thought in mind that it not only must sell you and your product, but your industry.

"3. Remember that the public are not interested primarily in you. They are interested in themselves. Therefore, they are not—

"a. Interested in *your* tax worries.

"b. Interested in the intricacies of *your* business.

"c. Alarmed by the increasing encroachments of local and federal governments on *your* business.

"d. Impressed by the size of *your* business."

Germany's Oil Supply Held Underestimated

N. P. N. News Bureau

NEW YORK, Nov. 27.—Many "careless" statements regarding Germany's vulnerability on account of lack of adequate supplies of petroleum products have been made which are "clearly not justified by the facts," Dr. Benjamin T. Brooks, consultant chemists of New York City declared in a survey of "Petroleum for Germany at War" in the American Chemical Society's publication "Industrial and Engineering Chemistry."

The whole matter, Dr. Brooks states, "may be roughly summarized by stating that if Germany gets all the Polish production, about 3,500,000 bbls., maintains her own domestic production of 4,500,000 barrels, manufactures 9,000,000 barrels from coal, continues to get only 25 per cent of Rumania's production, and gets none from Russia then her total available oil of all kinds, including motor fuel, will amount only to 28,000,000 barrels, or about one-third of her present war-time requirements."

The picture changes, the article adds, if Germany "gets all Rumania's surplus for export, about 33,000,000 barrels, and an equal amount from Russia; then her total available oil will be about 84,000,000 barrels, sufficient for her to maintain the war indefinitely so far as petroleum" is concerned.

Uncertain Factors Cited

Admitting that factors in the situation are uncertain, it is added that "it is just as unwarranted to assume that Germany will not get all Rumania's available surplus and will not get any oil whatever from Russia as it is to assume that she will be able to import all she needs or desires." Dr. Brooks states that Germany started this war much better off with regard to petroleum than she was in 1914.

Since the World war Germany has built up production of synthetic motor fuel from coal and during the past five years has imported surplus petroleum as a war reserve. Also, Dr. Brooks added, "a large but uncertain proportion of Rumania's oils which were closed to her in 1914 is now available."

"Imports from Russia are also possible and no one can say how much petroleum will be imported into Germany from Russia," he continued.

The article quotes statistics of the American Petroleum Institute which show that Germany's total petroleum consumption in 1933 was only 24,500,000 barrels, adding that "it is well known that beginning about 1934 Germany began to import oil for storage as a war reserve.

Reich's War Needs Estimated

"Allowing for a moderate increase in peace-time requirements and disregarding the increased production of synthetic motor fuel from coal, the statistics show that Germany may have accumulated a war reserve of 35,000,000 to 40,000,000 barrels.

The author quotes estimates of Germany's war requirements of 75,000,000 and 89,000,000 barrels, stating that "against these total war-time requirements, the production of synthetic motor fuel from coal is probably of secondary importance compared with the larger amounts of petroleum which may possibly be imported from Rumania and Russia, and without which Germany would be tremendously handicapped probably by the second year of war."

Germany 'Short' of Diesel Fuel

WASHINGTON, Nov. 27.—Negligible production of diesel oil for operating motor trucks is the weakest point in Germany's motor fuel set-up, according to a report from Counsul S. B. Redecker, Frankfort-on-Main, made public by the Department of Commerce. The report adds that while the Reich has achieved notable progress in expanding domestic output of light motor fuel, little success has been recorded up to this time in the manufacture of diesel and related heavier motor fuels. As a result, Germany is dependent upon imports for the bulk of its requirements. The number of trucks operating on diesel fuel has increased in a marked degree during recent years, the report adds.

Reich Builds Largest Plant To Make Synthetic Gasoline

N. P. N. News Bureau

WASHINGTON, Nov. 27. — The German government is establishing world's largest synthetic gasoline plant in northeastern Germany, near Stettin, to convert oil residues and coal from the Silesian mines into motor fuel, according to a report received by Commerce Department from its Frankfort-on-Main office.

The new plant will be considerably larger than the Leuna works, now the largest synthetic gasoline plant in the Reich, with a capacity of more than 350,000 metric tons (about 3,000,000 barrels) annually.

Completion will take about two years, but authorities expect to be in a position to start an initial output of gasoline from the plant by the middle of next year.

Other synthetic gasoline plants in Germany, most of them established in highly-industrialized areas, utilize lignite or lignite tar as raw material. The new plant is located in a strictly agricultural region, and will be designed to process chiefly oil-residues produced by the cracking process, and furnished partly by imports, and will also process Silesian coal which can be economically used because of cheap water transportation facilities.

Unofficial estimates place the output of synthetic gasoline in Germany during 1938 at 1,500,000 tons (12,750,000 barrels), a five-fold increase as compared with 1933 production.

DEATHS

John Clayton Miller

Funeral services for John Clayton Miller, 73 pioneer sales representative for Mid-Continent Petroleum Corp. were held in Tulsa Nov. 15. Mr. Miller, who had been in the sales branch of the oil industry since 1888, died in Tulsa Nov. 13 of heart attack. He began working in the Mid-Continent sales department in 1926 and in 1927 was appointed the company's first division manager, covering Oklahoma, Arkansas and Texas.

* * *

C. B. Turner

C. B. Turner, 65, senior vice president of South Penn Oil Co., died Nov. 21 in Pittsburgh. Mr. Turner's 45 years in the oil industry began as a roustabout in the Pennsylvania fields, culminating in 1932 in his election to vice presidency of South Penn.

* * *

O. H. P. Thomas

O. H. P. Thomas, independent producer, died Nov. 22 in Tulsa after a year's illness. He was born in Kentucky 59 years ago, but had lived in Tulsa for 29 years.

* * *

Henry Knower

Funeral services were held at St. Simons Island, Ga., on Nov. 27 for Henry Knower, Jacksonville, Fla., president of Southern Oil Stores, who died Nov. 25. His company, engaged in track-side operations, had outlets all over the Southeast.

Gulf Refiners Add to 'Unsold' Stocks of Motor Fuel

HOUSTON, Nov. 27.—Ten Gulf coast refiners added 161,426 barrels of motor fuel and 31,929 barrels of aviation gasoline to "unsold stocks the week ended Nov. 18, according to report by Gulf Coast Refiners Ass'n. Refinery runs were up slightly.

Details of the G.C.R.A. report are shown in next column:

	Houston District		Corpus Christi District		Louisiana District		Total	
	Nov. 18	Nov. 11	Nov. 18	Nov. 11	Nov. 18	Nov. 11	Nov. 18	Nov. 11
Aviation gas	141,512	138,380	94,492	65,695	None	None	236,004	204,075
Motor Fuel	469,230	352,166	250,812	206,450	None	None	720,042	558,616
Naphtha	7,091	8,324	104,190*	100,540†	None	None	111,281*	108,864†
Kerosine	33,000	None	None	40,000	None	None	33,000	40,000
Diesel Oil	None	None	None	None	None	None	None	None
Gas Oil	126,280	53,693	None	None	None	None	126,280	53,693
No. 5 fuel oil	None	None	None	None	None	None	None	None
Bunker "C" fuel	49,275	30,837	None	None	None	None	49,275	30,837
Crude runs	240,865	209,786	329,628	346,051	60,010	59,394	630,503	615,231

*62,530 bbls. high octane blending naphtha. †58,570 bbls. high octane blending naphtha.

All States Share in Gain In 1939 'Gas' Consumption

N. P. N. News Bureau

NEW YORK, Nov. 27.—An increase of 790,317,000 gallons, or 5.6 per cent, in gasoline consumption in the U. S. in the eight months ended August, over the corresponding period of last year, was reported by gasoline wholesalers and dealers under gasoline tax laws in the various states, the American Petroleum Institute reports. Consumption in the January-August period totaled 14,897,079,000 gallons, compared with 14,106,762,000 gallons the first eight months of 1938.

All states indicated increases, ranging from 1.23 per cent in North Dakota, to 21.09 per cent in Nevada. Two other states, besides Nevada, indicated increases higher than 10 per cent. These were Arkansas, 10.23 per cent; and Wyoming, 12.12 per cent.

The six largest consuming states reported these increases: California, 3.97 per cent; Illinois, 6.33; New York, 5.35; Ohio, 6.70; Pennsylvania, 4.85; and Texas, 5.71 per cent.

August Consumption Up 4.5%

In August, gasoline consumption totaled 2,183,210,000 gallons, an increase of 94,813,000 gallons, or 4.54 per cent over August a year ago. Increases ranged from 0.43 per cent in Delaware to 19.52 per cent in Nevada. Four states reported decreases, these being Maine, 1.33 per cent; Montana, 5.54; North Carolina, 2.63; and West Virginia, 5.90 per cent.

Daily average demand in August was 70,426,000 gallons, compared with 67,368,000 gallons in August a year ago, and 68,126,000 gallons in July this year.

Detailed figures are shown in the accompanying table.

California Allowable Set at 559,000 Bbls.

N. P. N. News Bureau

LOS ANGELES, Nov. 27.—December voluntary crude production curtailment figure for California has been set at 599,000 barrels daily by the Central Committee of California oil producers. This is the same figure as set for November. Maximum allowable for peak producing wells was cut from 210 to 204 barrels daily.

Daily average crude production in California during the first 21 days of November was 622,714 barrels, 4748 barrels daily under the average for the first 21 days of October, according to oil umpire reports.

California now has 18,949 producing wells, with an estimated aggregate potential of 2,375,899 barrels a day. Current market demand, according to reports, is 600,000 barrels daily.

'Gas' Stocks Rise Sharply

N. P. N. News Bureau

NEW YORK, Nov. 27.—Stocks of finished and unfinished gasoline at U. S. refineries jumped 1,899,000 barrels in the week ended Nov. 25, according to a report on refinery operations compiled today by the American Petroleum Institute.

Inventory of gasoline was larger in all districts of the country, with the exception of Rocky Mountain, where a cut in stocks of 12,000 barrels was reported.

The increase in gasoline stocks at California plants led the country, totalling 476,000 barrels, although East Coast plants were not far behind with a jump of 415,000 barrels in inventory of this product. Indiana-Illinois-Kentucky refineries had 398,000 barrels more gasoline in stocks at the end of the week, while Texas Gulf and Appalachian plants increased 214,000 and 115,000 barrels, respectively.

Crude runs to stills at U. S. refineries were off 5000 barrels on daily average, the Institute's report shows. However, a cut of 30,000 barrels daily in crude throughput at Texas Gulf plants was more than offset by a jump of 32,000 barrels daily in runs at Indiana-Illinois-Kentucky refineries. East Coast was the only other refining district to increase crude runs, with throughput up 9000 barrels daily.

Production of gasoline was off 61,000 barrels last week, according to the report. Manufacture of gasoline at Texas Gulf plants alone, however, was cut 114,000 barrels.

Stocks of distillate and gas oils held at refineries were reduced 466,000 barrels, while stocks of these products at terminals, in transit and in pipelines were cut 392,000 barrels. Refinery stocks were down in all districts with the exception of Inland Texas where inventory was up only 1000 barrels.

Refinery inventory of residual fuel oils were cut 477,000 barrels during the week, according to the report of the Institute. Stocks of this oil at terminals, intransit and in pipelines were cut 177,000 barrels. Stocks of residual fuel oils held at refineries in all districts of the country contributed to the reduction in inventory of this oil.

Gasoline Consumption by States, August and First Eight Months, 1939

(Figures in Thousands of Gallons)

	Month of			% Change 1939 over 1938	8 Months Ending With		% Change 1939 over 1938
	July, 1939 Gallons	Aug., 1939 Gallons	Aug., 1938 Gallons		Aug., 1939 Gallons	Aug., 1938 Gallons	
Alabama	21,813	22,219	20,857	+ 6.53	160,832	150,109	+ 7.14
Arizona	9,062	9,247	8,610	+ 7.40	70,299	67,950	+ 3.46
Arkansas	15,984	16,846	15,184	+10.95	116,439	105,634	+10.23
California	161,743	166,772	161,339	+ 3.37	1,210,236	1,164,055	+ 3.97
Colorado	24,539	25,994	24,545	+ 5.90	160,935	152,677	+ 5.41
Connecticut	35,126	34,804	33,279	+ 4.58	226,209	214,201	+ 5.61
Delaware	5,736	5,886	5,861	+ 0.43	38,851	37,553	+ 3.46
District of Columbia	13,257	13,378	12,558	+ 6.53	98,379	92,045	+ 6.88
Florida	27,035	26,424	25,357	+ 4.21	244,327	228,371	+ 6.99
Georgia	31,669	31,623	30,692	+ 3.03	238,116	221,622	+ 7.44
Idaho	10,158	11,183	10,831	+ 3.25	64,337	61,686	+ 4.30
Illinois	130,256	132,210	126,396	+ 4.60	924,897	869,870	+ 6.33
Indiana	60,286	63,426	59,763	+ 6.13	440,138	415,080	+ 6.04
Iowa	50,259	51,574	48,982	+ 5.29	365,927	350,675	+ 4.35
Kansas	50,236	49,003	48,173	+ 1.72	333,182	323,995	+ 2.84
Kentucky	24,614	25,916	23,874	+ 8.55	178,706	165,924	+ 7.70
Louisiana	21,844	23,243	20,792	+11.79	162,980	159,119	+ 2.43
Maine	17,867	18,503	18,752	— 1.33	98,746	95,855	+ 3.02
Maryland	26,864	27,663	26,656	+ 3.78	190,519	179,922	+ 5.89
Massachusetts	69,372	73,216	71,254	+ 2.75	473,401	449,086	+ 5.41
Michigan	108,540	114,712	106,031	+ 8.19	754,913	687,625	+ 9.79
Minnesota	54,713	59,139	57,726	+ 2.45	359,474	349,740	+ 2.78
Mississippi	17,189	20,152	16,904	+19.21	134,414	124,781	+ 7.72
Missouri	57,589	61,168	56,665	+ 7.95	424,846	396,777	+ 7.07
Montana	12,014	13,934	14,751	— 5.54	81,395	79,238	+ 2.72
Nebraska	22,451	22,878	22,320	+ 2.50	156,035	149,660	+ 4.26
Nevada	4,808	5,112	4,277	+19.52	30,544	25,224	+21.09
New Hampshire	10,364	11,330	10,982	+ 3.17	60,803	56,519	+ 7.58
New Jersey	81,558	86,075	82,574	+ 4.24	573,301	551,271	+ 4.00
New Mexico	9,067	9,521	8,846	+ 7.63	62,779	59,385	+ 5.72
New York	189,305	191,354	185,531	+ 3.14	1,251,521	1,187,914	+ 5.35
North Carolina	36,280	39,618	36,796	+ 7.67	279,444	260,236	+ 7.38
North Dakota	15,056	16,847	17,302	— 2.63	89,785	88,693	+ 1.23
Ohio	124,020	125,470	117,966	+ 6.36	893,944	837,842	+ 6.70
Oklahoma	41,158	41,248	37,629	+ 9.62	286,077	271,728	+ 5.28
Oregon	25,536	25,456	24,267	+ 4.90	161,469	152,796	+ 5.68
Pennsylvania	137,054	141,596	137,781	+ 2.77	961,509	917,029	+ 4.85
Rhode Island	12,265	13,089	12,789	+ 2.34	84,947	79,508	+ 6.84
South Carolina	18,078	18,926	18,285	+ 3.50	139,548	128,347	+ 8.73
South Dakota	14,045	13,931	13,293	+ 4.80	89,875	87,305	+ 2.94
Tennessee	26,969	27,825	26,980	+ 3.13	194,182	184,418	+ 5.29
Texas	121,075	119,833	114,170	+ 4.96	891,198	843,034	+ 5.71
Utah	9,931	10,135	9,782	+ 3.61	65,122	61,205	+ 6.40
Vermont	7,640	8,269	7,747	+ 6.74	44,468	42,092	+ 5.64
Virginia	33,825	36,182	35,301	+ 2.49	250,061	232,074	+ 7.75
Washington	34,097	35,739	35,002	+ 2.10	231,751	224,916	+ 3.04
West Virginia	*17,000	17,412	18,504	— 5.90	127,503	124,252	+ 2.62
Wisconsin	54,926	59,289	57,294	+ 3.48	372,933	356,891	+ 4.49
Wyoming	7,619	7,840	7,147	+ 9.70	45,782	40,833	+12.12
Total	2,111,892	2,183,210	2,088,397	+ 4.54	14,897,079	14,106,762	+ 5.60
Daily Average	68,126	70,426	67,368	+ 4.54	61,305	58,053	+ 5.60
Change from previous year:							
Total change	.....	+94,813	.....	.....	+790,317	.....	.....
Percentage change in Daily Average	.....	+4.54%	.....	.....	+5.60%	.....	.....

*West Virginia tax collections were placed on a receipt basis on July 1st, thus necessitating the payment of tax on certain classes of gasoline in storage. The figure indicated is our estimate of consumption as against the 30,272,000 gallons upon which tax was collected during the month, but which gallonage includes the gasoline contained in the storage referred to.

Safety Congress Picks Chicago

CHICAGO — The National Safety Congress and Exposition for 1940 will be held in Chicago, Oct. 7 to 11, at the Stevens Hotel.

Latest Oil Industry Statistics

Production and Inventory of Pennsylvania Lubricating Oils

(Compiled by National Pet. Ass'n. from reports of all companies which refined Penna. crude. Figures in bbls. of 42 U. S. gals.)

	Production Oct. 1939	Inventory Oct. 31, 1939
Raw long residuum (includes all raw long residuum below, and not salable as, 600 fire)	75,311	25,768
600 steam refined stock (includes all steam refined stock commonly sold or used as 600 and as raw material for bright stock)	301,928	204,737
Other steam refined stock (not included in above)	71,007	48,940
Finished dewaxed long residuum	54,900	36,782
Bright stock (does not include any material reported in above product)	202,746	167,784
Viscous neutral, below 180 vis. but not below 142 vis. @ 100	119,515	113,172
Viscous neutral, 180 vis. @ 100 & above	108,402	73,195

Crude Oil Production for the U. S.

(American Petroleum Institute figures)

	Week Ended Nov. 25 Barrels	Nov. 18 Barrels	Nov. 11 Barrels
Oklahoma	425,850	430,500	431,800
Kansas	184,850	179,500	164,900
Nebraska	100	.....	.....
Texas	1,552,650	1,331,250	1,547,400
Louisiana	271,500	266,450	267,500
Arkansas	67,300	70,700	68,950
Mississippi	1,350	1,100	950
Illinois	334,600	327,800	329,000
Eastern (Ill. excluded)	101,800	102,550	103,400
Michigan	64,650	64,700	64,150
Wyoming	73,150	63,300	62,000
Montana	16,100	16,750	17,100
Colorado	3,750	3,900	3,950
New Mexico	109,850	109,400	109,400
California	610,600	624,000	626,700
Total U. S.	3,818,100	3,592,000	3,797,200
Crude Imports	83,430	101,142	43,570
Total New Supply	3,901,530	3,693,142	3,840,770

Weekly Changes in U. S. Crude Oil Stocks*

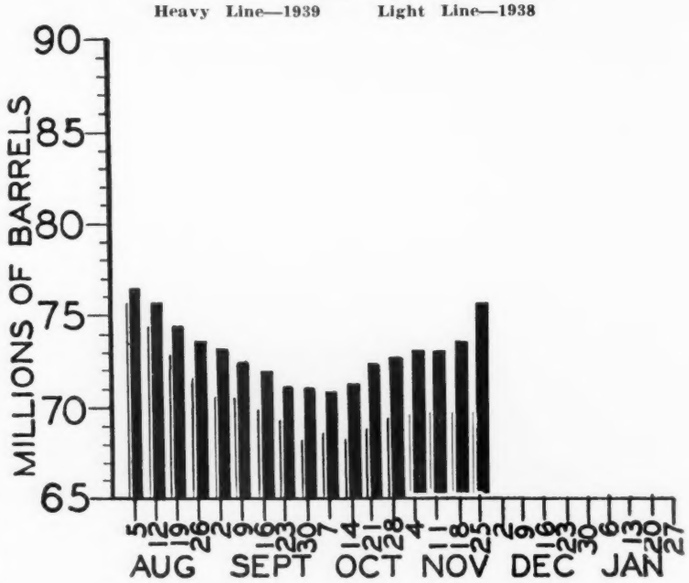
(Thousands of barrels)

Grade or origin	Nov. 4	Nov. 11	Nov. 18	Chng. from Nov. 11
Pennsylvania Grade	5,032	5,069	5,010	— 59
Other Appalachian	1,349	1,334	1,357	+ 23
Lima-Michigan	1,980	1,998	2,027	+ 29
Illinois-Indiana	15,995	15,909	15,809	—100
Arkansas	2,584	2,504	2,619	+115
Kansas	5,542	5,501	5,611	+110
Louisiana:	10,584	10,500	10,405	— 95
Northern	3,775	3,745	3,749	+ 4
Gulf Coast	6,809	6,755	6,656	— 99
New Mexico	5,292	5,548	5,544	— 4
Oklahoma	60,153	60,077	60,065	— 12
Texas:	66,697	65,075	65,692	+617
East Texas	13,811	13,828	13,926	+ 98
West Texas	14,811	14,092	14,068	— 24
Gulf Coast	17,792	17,158	17,353	+195
Other Texas	20,283	19,997	20,345	+348
Rocky Mountain	17,986	17,977	17,853	—124
California	35,641	36,230	35,514	—716
Foreign	2,159	2,315	2,329	+ 14
Total United States refinable	230,994	230,037	229,835	—202
Heavy in California	13,887	13,752	13,717	— 35

*As compiled by the U. S. Bureau of Mines.

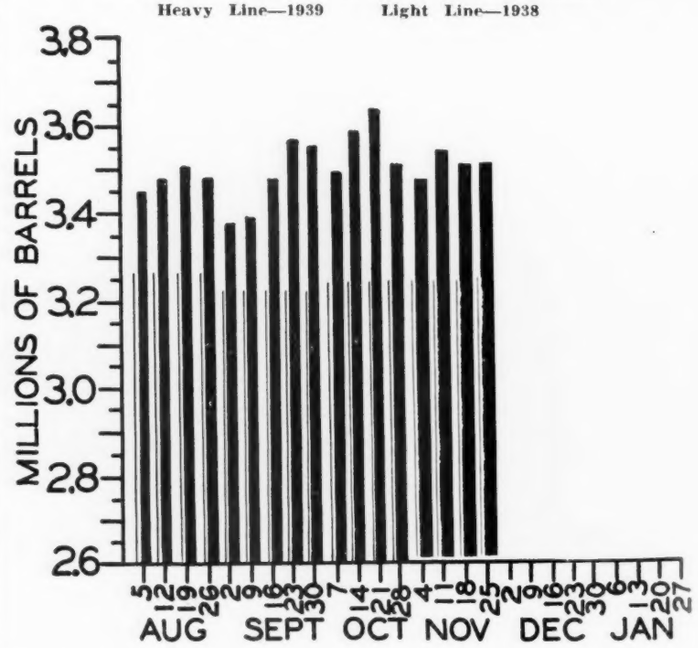
Total U. S. Motor Fuel Stocks

Heavy Line—1939 Light Line—1938



Daily Average Crude Runs to Stills

Heavy Line—1939 Light Line—1938



A. P. I. Weekly Refinery Report

(Figures in Thousands of Barrels of 42 Gallons Each)

Districts	Daily Average Crude to Stills Week Ended Nov. 25	Nov. 18	Per Cent of Reporting Capacity Operated Week Ended Nov. 25	Nov. 18	(a) Gasoline Production Week Ended Nov. 25	Nov. 18	Stocks Total Finished & Unfinished Motor Fuel (b) Week Ended Nov. 25	Nov. 18	Stocks of Gas Oil & Distillates At Refineries Week Ended Nov. 25	Nov. 18	At Terms. Trans. Pipelines Week Ended Nov. 25	Nov. 18	Stocks of Residual Fuel Oil At Refineries Week Ended Nov. 25	Nov. 18	At Terms. Trans. Pipelines Week Ended Nov. 25	Nov. 18
East Coast	581	572	94.5	93.0	1,657	1,542	18,309	17,894	6,784	6,871	6,117	6,316	5,346	5,444	4,134	4,336
Appalachian	128	133	88.3	91.7	472	501	2,954	2,839	284	302	161	161	412	357	.....	.....
Ind., Ill., Ky.	573	541	97.9	97.5	2,330	2,201	11,108	10,711	3,943	3,982	820	862	2,952	2,905	57	52
Okla., Kans., Mo.	259	259	75.7	75.7	(c)946	(c)941	6,186	6,149	1,765	1,763	41	30	2,586	2,723	.....	.....
Inland Texas	111	119	69.8	74.8	495	499	1,626	1,566	398	397	.....	.....	1,805	1,831	.....	.....
Texas Gulf	749	779	78.8	82.0	2,564	2,609	10,755	10,541	5,487	5,585	648	723	6,977	7,122	258	266
La., Gulf	126	137	72.0	78.3	296	303	2,674	2,630	1,060	1,131	27	29	1,910	1,999	300	282
No. La., Ark.	43	43	78.2	78.2	125	155	353	369	246	239	6	7	598	621	.....	.....
Rocky Mt.	55	48	85.9	75.0	222	234	1,957	1,930	150	145	.....	.....	438	442	.....	.....
California	518	519	69.5	69.7	1,444	1,529	15,273	14,797	8,003	8,063	1,757	1,840	59,579	59,611	22,429	22,380
Total Reporting	3,143	3,150	82.0	82.8	10,551	10,694	70,295	68,526	28,120	28,484	9,577	9,969	82,603	83,055	27,178	27,356
U. S. Total (d)	3,510	3,515			12,128	12,183	75,595	73,696	(e)28,950	(e)29,324	9,577	9,969	(e)84,928	(e)85,405	27,178	27,356
U. S. Total 11-25-38 (d)	3,244				11,230		69,483		32,259				118,789			

(a) Includes straight-run, cracked and natural blended.
(b) Includes stocks at refineries, in bulk-terminals, pipe lines and in transit.
(c) 12% of reporting capacity in this district did not report gasoline production.
(d) Estimated, U. S. Bureau of Mines basis.
(e) For comparability with last year these figures must be increased by stocks "At Terminals, etc." in California district.

Refining Technology

INCLUDING INTERNATIONAL PETROLEUM TECHNOLOGY

Dear Reader:

Almost exactly a year ago this page carried a heading one week which paraphrased the title to an old song. It was, "The Catalysts are Coming." Today the bagpipers at head of the parade have passed the reviewing stand and it is obvious that "The Catalysts Have Arrived."

A year ago development work was completed on the Houdry process but only three plants with a combined capacity of 16,600 barrels per day were operating. Now there are plants operating with a capacity of 180,000 barrels daily, over ten times that of a year ago.

Sulfuric acid alkylation also has completed its development period and now is snowballing in capacity. Five plants now operating in the United States have a capacity of 3425 barrels of alkylate per day. Six more plants are under construction or consideration. These will have a capacity of 8110 barrels of alkylate daily.

★ ★ ★

A year ago one paper was read at the A.P.I. meeting on catalysis. This year two sessions of the refining division of the institute were given over to the various catalytic processes. And the same week the California Natural Gasoline Association devoted most of its annual fall meeting to a discussion of sulfuric acid alkylation. At this meeting it was shown that California alone can produce 2,900,000 barrels per year of 100-octane aviation fuel by alkylation, leading and blending with straight run fractions.

At the A.P.I. meeting Gustav Egloff of Universal Oil Products Co. estimated that there is a potential for the United States of 3,275,000,000 gallons of aviation gasoline averaging 92 octane by dehydrogenation, polymerization and hydrogenation. By thermal alkylation he estimated it would be possible to produce 1,290,000,000 gallons of 95 octane gasoline from the same materials or by sulfuric acid alkylation 1,715,000,000 gallons.

These are astronomical figures when applied to aviation gasoline. They indicate that this war can be fought in the air if that be the plan of the war-lords. For nearly 20 years the prophets have said that the next war will be fought in the air. And now that the next war is here although a queer war as the French say, we can get some picture of aviation fuel demand from the fact that the first month saw British planes fly a million miles on reconnaissance, fighting and dropping propaganda leaflets. We have no official figures on French and German flying operations but it seems a fair assumption from news reports that the British did not do even half the flying.

★ ★ ★

One of the significant things about the several new processes which will enable the production of this great increase in aviation gasoline is that it makes the selection of new refining equipment a more complex problem. The refiner has more alternatives in taking the next step ahead. It is a relief to know that it will be unnecessary to start all over again by building a new refinery to produce an abundance of the highest octane fuels and that several accessory refining processes are available, but which one will best serve an individual set of conditions?

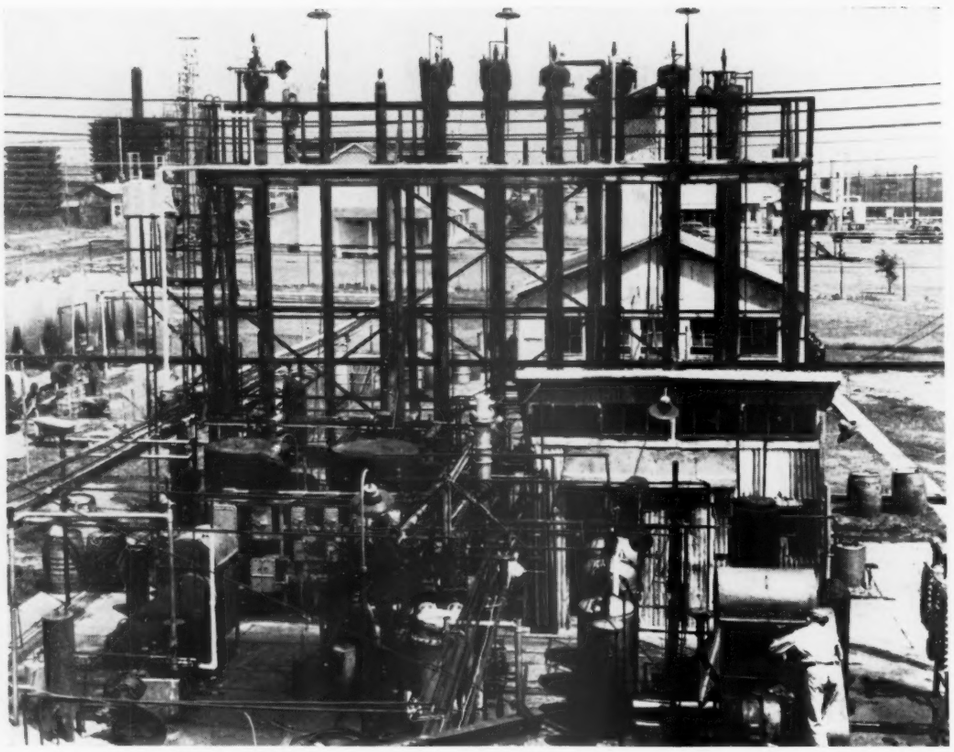
Sensing the confusion that this multiplicity of new processes may bring to those who are trying to understand the meaning of their availability in oil refining, Hugh W. Field of Atlantic Refining Co., presented the problem under the title "Petroleum-ization—1940." He prepared his A.P.I. audience with simple definitions of chemical terms as they have been applied to refining, and then with the aid of a chart, illustrated the positions of refiners today and their possibilities in 1940, discussing briefly the conditions which would make each step in advance advantageous.

Naturally included in this chart of refining possibilities were the new processes to hear discussions of which refiners thronged into the final sessions of the week. Two types of alkylation, catalytic reforming, catalytic dehydrogenation, and two desulfurization processes all of whose objectives were higher octane gasoline were described in papers. Among the significant facts brought out at the refining sessions was that not only were processes for raising octane number brought to the forefront but that efforts were being made toward processes which would enable tetra-ethyl lead do a better job. Purely in this category were the desulfurization processes referred to above. But even in the alkylation processes and any processes employing catalysts, particular attention was called to "improved lead susceptibility or response," both as a means of bettering octane number of gasolines or of reducing existing lead requirements of a given fuel.

Yours truly,

J. C. Chatfield

Managing Editor,
Refining Technology Edition.



Pilot plant in which development work was done in the production of neohexane by thermal alkylation

729.7

Thermal Alkylation to Produce Auto and Airplane Fuels*

By G. G. Oberfell† and F. E. Frey†

ABSTRACT

Alkylation is a recently developed addition to conversion processes applicable to gaseous hydrocarbons. The alkylation reaction can be conducted either thermally or catalytically to produce isoparaffinic fuels of high octane number, the well known iso-octane and other isoparaffins as well.

With non-selected conversion stock, such as ethane, propane, and butane, motor fuel can be produced in high yield by thermal alkylation in a two-stage process in which the lighter part of the stock can be cracked to produce olefins in one stage, which are reacted with the heavier part of the stock in a second, or alkylation, stage.

Neohexane‡ production is a special case of thermal alkylation with selected feed stocks. By selecting ethylene and isobutane as reactants, thermal alkylation at high pressures will produce neohexane, an isoparaffin of high octane number suitable for aviation fuel, but higher in volatility than iso-octane. A commercial plant for producing neohexane is now under construction.

Neohexane has a high lead susceptibility. With 3.0 cc. TEL per gallon it is comparable to c.p. iso-octane in antiknock rating. When the aviation gasoline ordinarily used now in blending to high octane number fuels is replaced by suitable mixtures of neohexane and iso-octane, finished aviation gasolines of balanced volatility and with much higher octane numbers, either leaded or unleaded, can be produced.

THE union of paraffins with olefins, usually designated alkylation, is a newcomer in the field of conversion processes.

Alkylation may be considered a special case of polymerization. Alkylation processes convert light hydrocarbons including at least some of a saturated type, directly into heavier hydrocarbons of a saturated type.

The alkylation of a paraffin by an olefin in its simplest form can be represented by the equation:

$$\underset{\text{olefin ethylene}}{C_2H_4} + \underset{\text{paraffin propane}}{C_3H_8} \rightarrow \underset{\text{paraffin pentane (n + iso)}}{C_5H_{12}}$$

wherein the paraffin propane combines with the olefin ethylene, both gases, to produce n-pentane and isopentane, two of the many paraffins in the motor fuel range.

* This is a condensation of a paper presented under the title, "Thermal Alkylation and Neohexane," at the 20th Annual Meeting of the American Petroleum Institute, Chicago, Nov. 17.

† Phillips Petroleum Co.

‡ "The prefix *neo-* indicates the presence of a C attached by all four valences to other C atoms." (F. C. Whitmore, *Organic Chemistry*, Van Nostrand Co., New York, 1937, page 21).

In addition to the demonstrated importance of alkylation in iso-octane manufacture, broadly considering its significance for the petroleum industry, other potentialities deserve mention. The trend toward higher octane numbers has led in recent years to more unsaturated and aromatic motor fuels. Paraffinic fuels, as they occur in nature or result from conventional refining, have as a rule discouragingly low octane numbers. Alkylation can produce isoparaffins high in octane number and ranging widely in volatility. Paraffinic fuels are unique from the standpoint of stability, pleasant odor, high lead susceptibility, maximum calorific value per pound and clean combustion. The naturally occurring paraffin reactant is incorporated directly into the motor fuel molecule. This makes for high yield and conserving of the combined hydrogen.

Despite their greater abundance ethane and propane have been utilized hardly at all in gas polymerization in comparison with butane and refinery gas unsaturates. Processes proposed for ethane and propane generally require that they be cracked or dehydrogenated to olefins in one process step and the olefins polymerized in a second step, with the inherent expense of multistage operation. The use of alkylation in such a process means that a part of the paraffin reactant need not be subjected to the dehydrogenation step. Some saving is effected in processing and the yield loss in dehydrogenation reduced. Contrasting alkylation so applied with catalytic polymerization, the latter as ordinarily practiced yields the less volatile gasoline hydrocarbons, while the former can be used when desired to produce the more volatile, as a means of volatility adjustment.

Thermal Alkylation Not Limited to Isoparaffins

The thermal alkylation reaction is brought about by subjecting a mixture of paraffins and olefins to a temperature bordering on the cracking range, approximately 950° F., at a high pressure, for example 3000-5000 pounds per square inch, the high pressure being required to reverse the cracking tendency. Olefins are readily polymerized by themselves under such conditions, but by maintaining the concentration of olefin low and paraffin high during reaction the polymerization is held back and the union of paraffin with olefin becomes the predominating reaction. This entails the addition of olefin during reaction at such a rate that its concentration never becomes too high.

Sulfuric acid alkylation bears a general resemblance to thermal alkylation, except that the acid, acting as catalyst, brings about reaction at ordinary temperature and low pressures. The two types of alkylation are markedly different in the way different individual paraffins and olefins respond. As to the olefins, acid alkylation reacts isobutylene, n-butenes, and propylene readily, and ethylene with difficulty. Thermal alkylation on the contrary reacts isobutylene with difficulty, n-butenes and propylene more readily, and ethylene most readily of all.

As to the paraffins, acid alkylation is selective and limited to isoparaffins, the simplest of which are isobutane and isopentane, while thermal alkylation reacts these isoparaffins and normal paraffins with equal ease, n-pentane and n-butane reacting readily as well as propane. Ethane and methane, however, react with difficulty. In its application to gas polymerization, thermal alkylation furnishes a route for converting ethane, propane and butane into motor fuel; ethane can be cracked or dehydrogenated to ethylene which can be used to alkylate propane and butane in a second step. Propane or butane can also serve as an olefin source through cracking or catalytic dehydrogenation.

By the selection of individual paraffins and olefins for thermal alkylation primary reaction products result from the union of one molecule of each, accompanied by secondary products. Ethylene and propane yield mainly isopentane, some n-pentane; ethylene and n-butane, 3-methyl pentane; ethylene and isobutane, neohexane; propylene and propane, 2,3-dimethylbutane and 2-methylpentane Cy-

Contents...

REFINING TECHNOLOGY

November 29, 1939

Thermal alkylation compares favorably with thermal polymerization economically and is a practical process for producing motor fuels as well as aviation fuels. G. G. Oberfell and F. E. Frey of Phillips Petroleum Co. report R-502

California could produce 2,900,000 barrels of 100-octane fuel yearly by alkylation, leading and blending with straight run fractions A. L. Blount told the California Natural Gasoline Association in a symposium on alkylation Nov. 17 at Los Angeles R-510

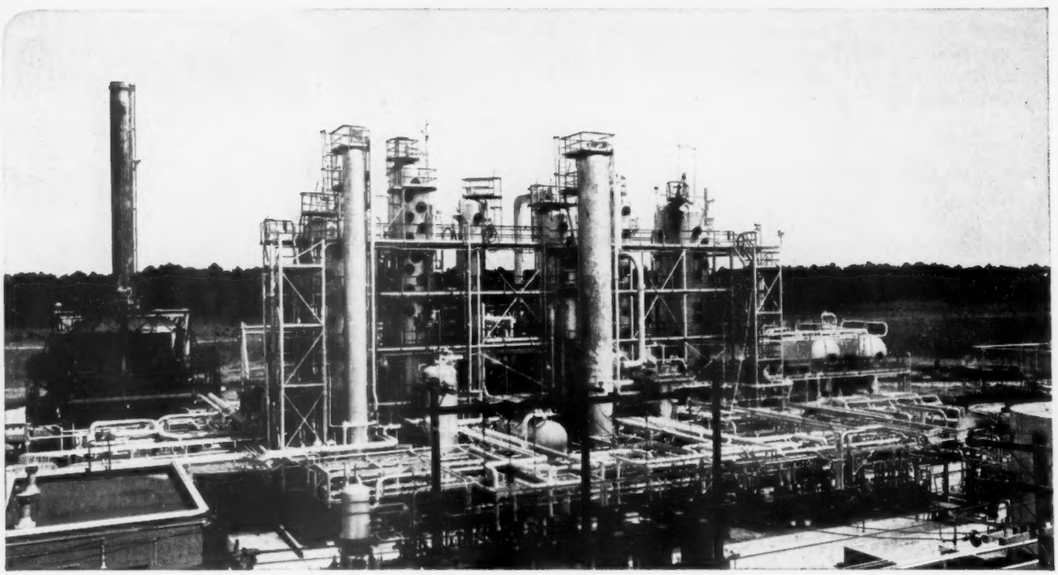
Catalytic reforming is advantageous in production of aviation fuel in changing low-grade straight-run gasoline into high-octane aviation fuel base stock. A. G. Peterkin, J. R. Bates and H. P. Broom of Houdry Process Corp. report R-512

Just where the numerous new processes for manufacture of high-octane gasoline fit into present refining situations is answered and the method of approaching the subject graphically outlined by H. W. Field R-517

Catalytic dehydrogenation boosts polymerization process yield by taking excess gaseous paraffins and converting them to olefins. The reaction takes place at 1100° F. and very low pressure according to A. V. Grosse, V. N. Ipatieff, Gustav Egloff and J. C. Morrell R-520

Advertisers' Index ..... 43 and R-523

Other Editorial Index 7



Phenol Extraction Leads

- The capacity of Phenol Treating Plants in operation or contracted for in the world exceeds the capacity of any other type of solvent treating process.
- This leadership is due in great measure to the inherent advantages of the Phenol Extraction Process. This process treats a wide variety of light or heavy stocks from different crude bases to produce a maximum yield of high quality raffinates.
- Kellogg-built Phenol Extraction Plants are characterized by ease of operation, flexibility and low operating costs.

KELLOGG

LICENSING AND CONSTRUCTION AGENTS under United States and foreign patents for:
Catalytic Processes for Cracking, Reforming, Reversion, Dehydrogenation, Alkylation, Desulphurization

- Gasoline Products Company, Inc., Pyrolytic Cracking
- The Polymerization Process Corporation, Thermal and Catalytic Polymerization
- JUIK Processes for Lubricating Oil Refining with Propane and Phenol Deasphalting • Dewaxing • Solvent Extraction and Acid Treating Plants
- The Gray Processes Corporation, Clay Treating

THE M. W. KELLOGG COMPANY • JERSEY CITY, NEW JERSEY • 225 BROADWAY, NEW YORK
Los Angeles: 1031 South Broadway
Tulsa: Philtower Building
EUROPEAN REPRESENTATIVE: Compagnie Technique des Petroles, 134 Boulevard Haussmann, Paris, France.

Fred E. Frey, associate director of research, Phillips Petroleum Co., left the Bureau of Mines in 1927 to join Phillips. He is an Ohioan, like G. G. Oberfell, and graduate of the College of Wooster and Ohio State University (M.S., 1924)

G. G. Oberfell presented the accompanying paper in Chicago. He is well-known as vice-president of Phillips Petroleum Co. in charge of research. He is also director and member of the company's executive committee. He has been with Phillips since 1925 following periods with the Bureau of Mines, The Ohio Fuel Supply Co., Chemical Warfare Service, Chestnut and Smith, and his own consulting firm

cloparaffins react similarly, cyclohexane plus ethylene yielding ethylcyclohexane.

In the synthesis of an individual hydrocarbon such as neohexane by the thermal alkylation process the olefin and paraffin feed stocks must be of rather high purity, the conversion per pass must be relatively low, and elaborate refining is needed for the finished products. In the manufacture of motor fuel by thermal alkylation an entirely different set of requirements prevails. In this broader and important application a considerably higher conversion per pass may be used, which permits greater output from the plant and produces an alkylate of lower volatility.

The products do not reflect the reactants used to so great a degree, but light gas and tar formation remain low with consequent high gasoline yields relative to olefins and paraffins consumed. In combination with low pressure cracking as a source of olefins, thermal alkylation constitutes a variant on the familiar two-stage principle, characterized by high yields and much flexibility in the use of feed stock. Ethane, propane, and butane occur together in natural gas or refinery gas. Where their value as gaseous fuel is not too high they can be recovered and converted to produce the maximum volume of motor fuel by polymerization, by virtue of the non-selectivity of thermal alkylation with respect to conversion stock, without the addition of other conversion steps to the two-step process. Since ethane and propane are ordinarily abundant as compared to butane in such situations, propane must be utilized in the alkylation step to make the volume of propane-butane more or less commensurate with the olefin derived from cracking ethane and the remainder of the propane. Under such circumstances the process is flexible with respect to reduction in available volume of butane. On the other hand, light straight run or natural gasoline hydrocarbons in the normally liquid range can be included to effect reduction in volatility when desired.

Finally, the alkylate resulting from such operations, being intended for motor fuel blending requires much less fractionation and refining. Engineering and cost studies indicate that thermal alkylation in general compares favorably with thermal polymerization and is very definitely in the economic range for motor fuel entirely apart from the more dramatic role of synthesizing hydrocarbons of high purity.

Neohexane Process Soon in Commercial Operation

By January 1940 Phillips Petroleum Co. will have in operation a plant for producing neohexane, a new aviation fuel ingredient, by the reaction of ethylene with isobutane by thermal alkylation. The process consists of a cracking step wherein an ethane-propane mixture is cracked to ethylene at low pressure and an alkylation step wherein the ethylene is reacted with isobutane under high pressure. The process is diagrammatically illustrated in Figure 1, which applies directly, however, to the pilot plant studies described below.

The thermal alkylation operation has been studied in a pilot plant wherein an ethane-propane mixture is cracked at about 1425° F. and a pressure a few pounds above atmospheric for optimum ethylene formation. The gaseous products are cooled, compressed, scrubbed with isobutane to remove light oils formed in cracking, and contacted with isobutane which absorbs the ethylene. The ethylene-isobutane mixture is pumped to a manifold which distributes it among 10 inlets situated along a tube coil which constitutes the reaction zone through which a separate stream of isobutane of greater volume is continuously pumped. A preheat coil imparts the desired reaction temperature, about 950° F., to the isobutane stream prior to its entry into the reaction zone, and this temperature, within the reaction zone, is maintained by a flow of hot combustion gases. Conversion pressures are in the range 3000-5000 pounds per square inch. The liquid products are separated from the reactor effluent by conventional fractionation.

In Table 1 inspection data are shown for the total polymer (Sample A) after debutanizing and redistilling. After removing the neohexane from Sample A by fractionation and combining the lighter and heavier material, Sample B is obtained.

TABLE 1

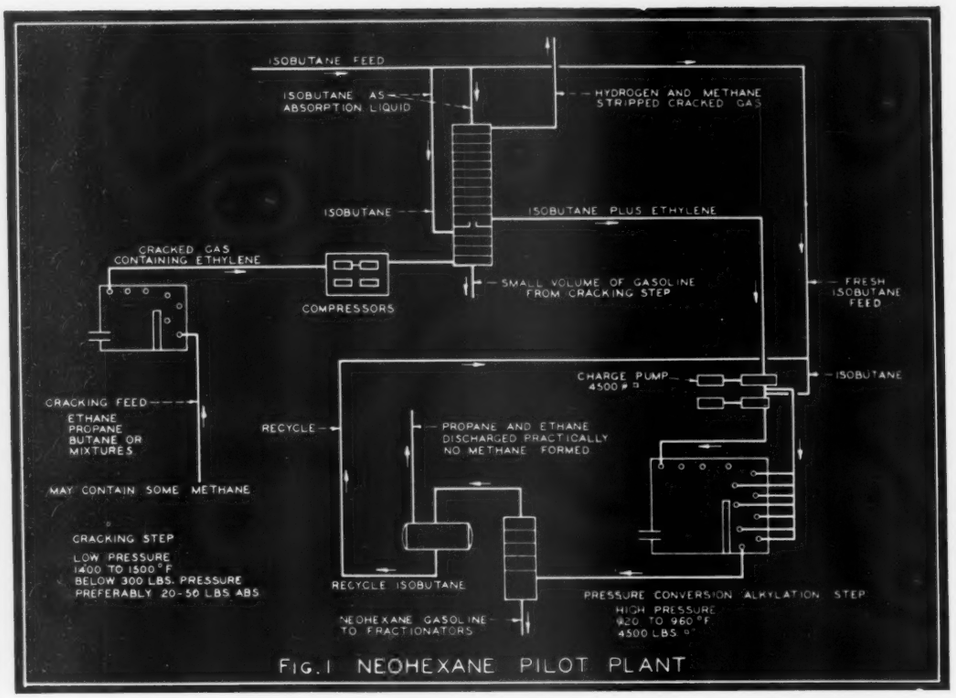
Inspection Data on Products From Pilot Plant Alkylation of Isobutane by Ethylene

Sample Description	A Debutanized Alkylate	B A, Minus Neohexane Content	C* Neohexane Plus Volatility	D† Lower Fraction
Octane Number (ASTM)	82.5	78.4	100.2	99.6
API Gravity at 60° F.	73.2	67.7	76.6	75.6
Reid Vapor Pressure lb. per sq. in.	7.6	6.9	6.9	6.4
ASTM Distillation Per Cent Evap. at °F.				
First Drop	118	116	128	129
10	136	149	139	146
50	157	186	156	164
90	268	273	217	221
95	310	325	222	230
End Point	370	399	258	282
Sum of 10 + 50% Points	...	...	295	310

*A blend of 40 volumes of acid treated C_7-C_8 fraction (165°F.-243°F.) with 60 volumes of neohexane fraction. Octane rating is by the ASTM method with 3 cc. TEL per gallon.

†A blend of 50 volumes of acid treated C_7-C_8 fraction (165°F.-243°F.) with 50 volumes of neohexane fraction. Octane rating is by the Army method with 3 cc. TEL per gallon.

Sample C represents the product obtained by blending the neohexane fraction with a fraction including all the C_7 and C_8 material in the alkylate A, acid treated to eliminate unsaturates and redistilled. Such a blend is of interest in that it represents a 100-octane fuel of paraffinic type containing no iso-octane. It meets specifications for aviation fuel in all respects except that the sum of the 10 + 50 ASTM distillation points is a little below the specified


ISOBUTANE FEED
ISOBUTANE AS ABSORPTION LIQUID
HYDROGEN AND METHANE STRIPPED CRACKED GAS
ISOBUTANE
ISOBUTANE PLUS ETHYLENE
CRACKED GAS CONTAINING ETHYLENE
COMPRESSORS
SMALL VOLUME OF GASOLINE FROM CRACKING STEP
FRESH ISOBUTANE FEED
CHARGE PUMP 4500 P.S.I.G.
ISOBUTANE
CRACKING FEED
ETHANE PROPANE BUTANE OR MIXTURES
RECYCLE
PROPANE AND ETHANE DISCHARGED PRACTICALLY NO METHANE FORMED
MAY CONTAIN SOME METHANE
CRACKING STEP
LOW PRESSURE 1400 TO 1500°F BELOW 300 LBS. PRESSURE PREFERABLY 20-50 LBS. ABS.
RECYCLE ISOBUTANE
NEOHEXANE GASOLINE TO FRACTIONATORS
PRESSURE CONVERSION ALKYLATION STEP
HIGH PRESSURE 920 TO 960°F 4500 LBS. G.
FIG. 1 NEOHEXANE PILOT PLANT

307° F. minimum. Sample D represents a blend of slightly lower neohexane content which meets the sum specification as well.

Neohexane

Neohexane is one of the five possible isomeric forms of hexane. As aviation fuels or fuel ingredients, these hydrocarbons are in the antiknock range of synthetic iso-octane, but by reason of their higher volatility can be used to provide volatility flexibly in blends of high antiknock rating. Isoparaffins as a class are resistant to oxidation effects and consequently are advantageous under conditions requiring long intervals of storage.

Neohexane is the most volatile of the hexanes, and the boiling point, as it happens, is separated by considerable intervals from adjacent paraffins. This makes its manufacture in concentrated form by fractional distillation easy as will be evident from the boiling point tabulation (Table 2). Physical properties are listed in Table 3.

TABLE 2

Boiling Points

	Deg. Fahr.	Deg. Cent.
Isopentane	82.3	(27.95)
n-Pentane	96.8	(36.0)
Neohexane	121.5	(49.7)
2, 3-Dimethylbutane	136.6	(58.1)
2-Methyl pentane	140.4	(60.2)
3-Methyl pentane	145.8	(63.2)
n-Hexane	155.8	(68.8)

TABLE 3

Properties of Neohexane

Reid vapor pressure, lb.	9.5
A.P.I. Gravity	84.9
A.S.T.M. Octane number	94
Boiling point, °F. (°C.)	121.5 (49.7)
Specific gravity (20°C./4°C.)	0.6494
Refractive index n_D^{20}°C.	1.36887
Freezing point (°F.) (°C.)	—144.8 (—98.2)

From an antiknock viewpoint, a most important property of neohexane is its exceptionally high tetraethyl lead susceptibility. This quality is best demonstrated in Table 4, which shows the lead susceptibility of neohexane compared to that of a blend of the primary standards, iso-octane and normal heptane, of the same unleaded octane number as neohexane.

TABLE 4

Lead Susceptibility of Neohexane and Iso-Octane

	Octane Number (ASTM Method)	TEL Requirement to Equal C.P. Iso-octane Plus Indicated TEL (ASTM Method) 0.0 cc.	1.0 cc.	2.0 cc.	3.0 cc.
Neohexane (99 per cent pure)	94	0.25	1.35	2.25	3.0
Iso-octane-Normal Heptane blend	94	0.30	2.90	4.85	6.35

It is of interest to note that at a TEL concentration of 3.0 cc. per gallon, neohexane is equal in antiknock value to C.P. iso-octane.

The antiknock test method used for securing octane ratings in Table 5 was the A.S.T.M. method with the following modifications: (1) removal of the throttle plate, (2) the use of a 10/16 inch venturi rather than the standard 9/16 inch venturi and (3) the spark advance held constant at 25° BTDC.

TABLE 5

Knock Test By Modified A.S.T.M. Method

Octane Number	cc. TEL per gallon C.P. Isooctane	TEL Required to Equal Leaded Isooctane: Neohexane	50% Neohexane + 50% C.P. Isooctane	39% Isopentane + 61% C.P. Isooctane
100	0.0	0.25	0.1	0.25
109.1	1.0	1.3	1.1	1.5
112.1	2.0	2.2	2.1	2.6
114.1	3.0	2.9	2.9	3.75
118.7	6.0	4.5	4.9	7.45
.....	9.7	6.0	...	....

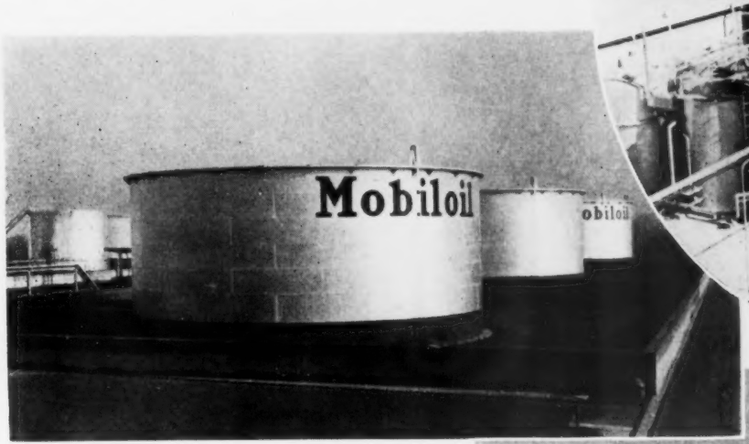
The superiority of neohexane to C.P. iso-octane at comparatively high TEL concentrations is well demonstrated in Table 5. The blending effect of neohexane is shown in the third column of the table. Here it is shown that the high antiknock value of leaded neohexane can be fully realized in blends of this material with iso-octane.

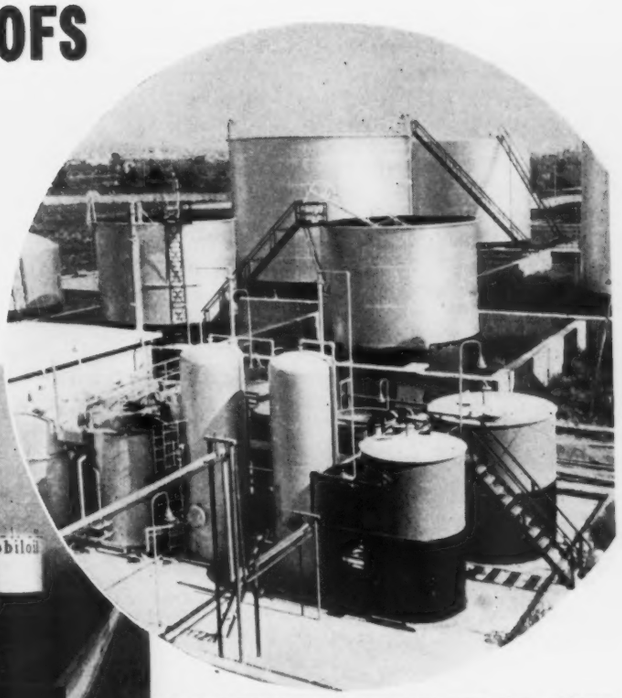
Volatility Blending Relationships

From a consideration of the volatility, antiknock and TEL response properties of neohexane, it is apparent that the potential value of this new synthetic hydrocarbon lies chiefly in its use in raising the maximum attainable octane number of either leaded or unleaded aviation fuels while

WIGGINS PONTOON ROOFS

Reduce Evaporation Losses for the Modern Refinery at Naples, Italy





Directly above: Three of the twenty-three Wiggins Pontoon Roof tanks at Naples. These have a capacity of 80,000-bbls. each.

In Circle: Close-up of a section of the Naples refinery. *At right*: General view of the refinery, with Mount Vesuvius in the background.

THE Raffineria di Napoli, S.A.I. refinery at Naples, Italy, employs completely modern processing equipment, including a catalytic cracking unit, solvent lubricating oil refining and dewaxing units, contact filtering plant, and compounding and blending facilities. Products consist of aviation and motor gasoline, kerosene, gas and diesel oils, lubricating oil, paraffine wax, greases, asphalt and fuel oil. There are approximately 175 storage tanks at this refinery, 23 of which are equipped with Wiggins Pontoon Roofs.

The use of pontoon roofs is world-wide, for their many users have discovered that this modern vapor saving equipment provides both flexible and efficient operation. Tanks can be filled and emptied as often or as seldom as required with complete assurance that the grade of oil handled will continually be guarded against evaporation and deterioration. This versatile performance is maintained for all grades of oil that do not boil at ordinary atmospheric temperatures.

For information or quotations, address our nearest office. There is no obligation.

CHICAGO BRIDGE & IRON COMPANY

Plants at BIRMINGHAM, CHICAGO and GREENVILLE, PA.

Cleveland ..... 2206 Rockefeller Bldg.	Philadelphia ..... 1614-1700 Walnut St. Bldg.	Dallas ..... 1439 Liberty Bank Bldg.
Houston ..... 2919 Main Street	Chicago ..... 2125 Old Colony Bldg.	San Francisco ..... 1060 Rialto Bldg.
Tulsa ..... 1607 Hunt Bldg.	Detroit ..... 1513 Lafayette Bldg.	Los Angeles ..... 1422 Wm. Fox Bldg.
New York ..... 3345—165 Broadway Bldg.	Birmingham ..... 1534 North 50th Street	Boston ..... 1516 Consolidated Gas Bldg.

LICENSEES: Horton Steel Works, Limited, Fort Erie, Ontario, Canada; The Motherwell Bridge & Engineering Co., Ltd., Motherwell, Scotland; The Whessoe Foundry & Engineering Co., Ltd., London, England; Worms & Cie, Paris, France; Compagnia Tecnica Industrie Petroli S.A.I., Rome, Italy.

at the same time maintaining fuel characteristics of balanced volatility. This is particularly true since it is a fact that synthetic iso-octane has an average boiling point (220-240° F.) considerably in excess of the average boiling point (180-210° F.) of the conventional aviation gasolines. From this consideration it is obvious that to obtain full advantage of the superior antiknock properties of synthetic iso-octane it is desirable to have a blending material of considerably lower average boiling point but with superior antiknock properties. Neohexane with an average boiling point of 121° F. and an octane number of 94 fills this need.

Table 6 presents A.S.T.M. distillation data, octane number, and vapor pressures for a series of blends of neohexane, commercial iso-octane, aviation straight run naphtha, and isopentane. The commercial iso-octane was composed largely of the synthetic higher boiling iso-octanes. The aviation straight run naphtha was a depentanized straight run aviation gasoline of the usual conventional volatility characteristics. The neohexane and isopentane were of high purity.

In these blending experiments the naphtha and the iso-octane were "isopentanized" and the iso-octane was "neohexanized" to 5.5, 7.0 and 8.5 pounds, giving three base materials in each vapor pressure bracket for cross blending. The three blends in each vapor pressure bracket were blended in pairs with each other in 1/3 and 2/3 proportions.

In connection with these antiknock relationships it should be mentioned that the aviation naphthas quite generally have basic lead susceptibilities inferior to those possessed by isopentane, neohexane and commercial iso-octane. Since the octane number of these blends are almost directly related to the percentage of naphtha in them—the higher the percentage, the lower the octane number—it follows that the basic TEL susceptibility of the blends will be higher, the higher the octane number of the blend.

As would be expected from the inspection data on the four blending ingredients, the blends meet conventional aviation gasoline volatility specifications through most of the blending range. All the blends meet the conventional 10 and 90-per-cent specifications, while in certain very limited blending proportions the blends have too little or too much volatility to meet the conventional volatility specifications.

The 7.0-pound blends are, of course, of most immediate significance, although it is of interest to know that some of the 8.5-pound blends have higher average boiling points than some of the 5.5-pound blends. With the data pertaining to the 7.0-pound blends as a basis, Figure 2 has been prepared. The percentages of naphtha and of neohexane are the co-ordinates in the figure. In light lines are shown the percentages of iso-octane. The percentage of isopentane at any point in the diagram is, of course, the difference needed to total 100%. All points in the tri-

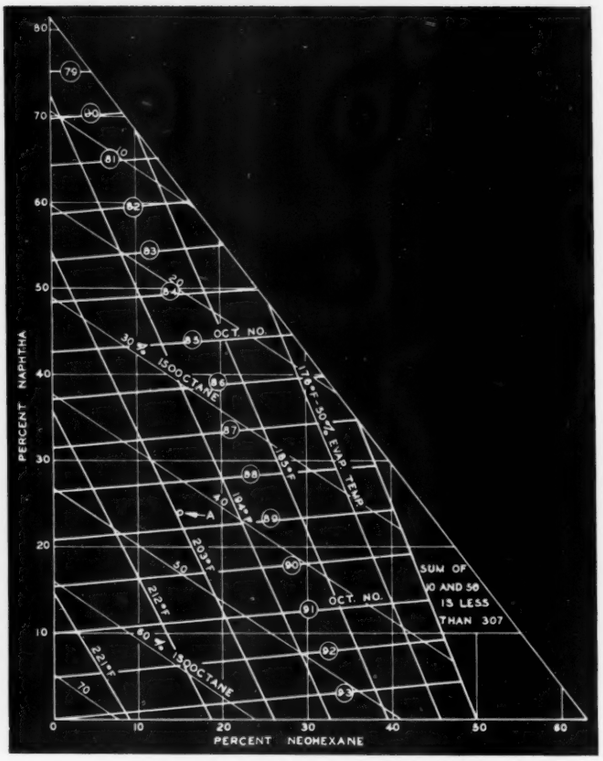


Fig. 2. Antiknock and volatility effect of neohexane in high-octane-number aviation gasolines. Blends are of 7 pounds Reid vapor pressure and include neohexane, iso-octane, isopentane, and aviation straight-run naphtha

TABLE 6—Inspection Data On Neohexane Blends
Arranged in three vapor pressure brackets, in order of decreasing naphtha content

Percentage Composition				ASTM Distillation Data Temp. (°F.) at indicated % Evaporated					
Naphtha	Iso-Octane	Neo-Hexane	Iso-Pentane	10	50	90	10 + 50	Octane No.*	R.V.P. (lbs.)
100	...	...	...	176	202	247	378	75.0†	3.65
...	100	...	...	225	234	263	459	94.0†	1.40
...	...	100	...	120	121	122	241	94.0†	9.85
...	...	...	100	82	82	82	164	90.0†	21.00
90.5	....	....	9.5	155	197	243	352	76.4	5.5
60.3	27.2	....	12.5	157	209	250	366	82.0	5.5
60.3	18.4	15.0	6.3	154	196	247	350	82.3	5.5
30.2	54.3	....	15.5	157	220	256	377	87.5	5.5
30.2	36.7	30.0	3.1	151	193	248	344	88.1	5.5
....	81.5	....	18.5	158	230	258	388	93.3	5.5
....	72.7	15.0	12.3	155	224	257	379	93.5	5.5
....	63.8	30.0	6.2	152	210	254	362	93.8	5.5
....	55.0	45.0	....	148	190	251	338	94.0	5.5
81.5	....	....	18.5	139	189	241	328	77.8	7.0
54.4	24.8	....	20.8	139	203	247	342	82.8	7.0
54.4	12.3	21.0	12.3	139	179	242	318	83.2	7.0
27.2	49.7	....	23.1	138	216	253	354	87.8	7.0
27.2	24.7	42.0	6.1	137	165	243	302	88.6	7.0
....	74.5	....	25.5	138	226	256	364	93.0	7.0
....	62.0	21.0	17.0	137	209	253	346	93.3	7.0
....	49.5	42.0	8.5	137	181	250	318	93.7	7.0
....	37.0	63.0	....	134	155	245	289	94.0	7.0
72.5	....	....	27.5	127	177	237	304	79.1	8.5
48.3	22.7	....	29.0	128	193	247	321	83.7	8.5
48.3	6.3	27.0	18.4	127	160	237	287	84.1	8.5
24.2	45.3	....	30.5	128	209	252	337	88.2	8.5
24.2	12.7	54.0	9.1	126	145	234	271	89.0	8.5
....	68.0	....	32.0	128	223	255	351	92.7	8.5
....	51.7	27.0	21.3	127	181	250	308	93.1	8.5
....	35.3	54.0	10.7	126	150	243	276	93.6	8.5
....	19.0	81.0	....	126	135	224	261	94.0	8.5

*Calculated arithmetically from octane numbers of ingredients.
†Assumed as representative.

angular diagram represent a total composition of 100%. Thus the upper apex of the triangle is a blend containing 81.5% naphtha and 18.5% isopentane, the lower left apex is a blend containing 74.5% iso-octane and 25.5% of isopentane, and the lower right apex is a blend containing 63% neohexane and 37% iso-octane. The vertical axis represents the condition of conventional blending to high octane numbers using iso-octane, aviation naphtha, and isopentane. The horizontal axis represents blends using neohexane, isopentane and iso-octane but containing none of the low octane number aviation naphtha. All points in the body of the diagram represent combinations of these two blending practices, using all four ingredients.

Sloping sharply downward is a family of curves (dark lines) showing the 50% temperatures of the blends. The extreme right line parallel to the 50% temperature lines represents the dividing line between blends with more and less than 307° F. for the sums of the 10% and 50% temperatures; all blends to the left of the line having sums of more than 307° F. Sloping slightly upward from left to right is another family of curves (dark lines) showing the unleaded octane numbers of the blends.

As an example of the use of Figure 2, the point designated as A has the following composition: Per cent neohexane, 15.0 (horizontal axis); per cent naphtha, 25.0 (vertical axis); per cent iso-octane, 43.3 (interpolation between 40 and 50 lines); per cent isopentane, 16.7 (by difference); and the following definite characteristics: Unleaded octane number, 88.4 (interpolation between 88 and 89 lines); 50% Evap. temperature, 202° F. (interpolation between 194 and 203 lines); Sum of 10 and 50% temperatures, more than 307° F. (left of 307 boundary); Reid vapor pressure, 7.0 pounds (basic premise) and the following approximate characteristics from the data on 7.0-pound blends in Table 6: 10% evaporated temperature, 134-139° F.; 90% evaporated temperature, 241-256° F.

The figure graphically shows the advantage of neohexane in making it possible to have higher octane number gasolines with balanced volatility. Thus, for any given midpoint limitation it is possible to make finished gasolines of considerably higher octane numbers when neohexane is used to the maximum extent. For a midpoint maximum of 212° F., the maximum attainable clear octane number without neohexane is 86.2, while replacing the naphtha with a mixture of neohexane and additional iso-octane makes it possible to get to 93.3 octane number, a gain of 7.1 octane numbers. Under similar conditions, but for a midpoint maximum of 203° F., the gain is 10.6 octane numbers, from 82.8 to 93.4. For higher and lower midpoint maxima the gains are less and more, respectively. The improved basic TEL susceptibility of these higher octane number gasolines, previously mentioned, is of considerable value in the case of ethylized gasolines.

The question will arise in many minds as to the practical vaporization characteristics of such fuels as are represented by the horizontal axis of Figure 2. These fuels are essentially three component mixtures with considerable differences among the boiling points of the individual components. As is shown in Figure 2, the A.S.T.M. distillation points in almost all the blending range are well within conventional limits.

But the question is whether the A.S.T.M. distillation data can be expected to give the established relationship to actual vaporization in an engine manifold in the case of such three component mixtures. Much work has been done along this line but it seemed desirable to determine if there are any unexpected vaporization characteristics. This work is now in progress, but is too incomplete to be discussed here in detail except to state that thus far there has been a reasonably good agreement between the actually determined air-equilibrium distillation curves and the air-equilibrium distillation curves that would have been predicted from the relationships established by the earlier investigators. This fact would indicate that the conventional volatility specifications will be applicable to even the three component blends.

For every set of corresponding blending ingredients, a diagram similar to Figure 2 can be prepared and in each case there will be a pronounced increase in the maximum octane number attainable for a given midpoint volatility when neohexane is used.

Tank Steamer Paper Wins Medal For Atlantic's Chief Engineer

Lester M. Goldsmith, chief engineer of the Atlantic Refining Co., whose picture appears on this week's cover, will be awarded the Melville medal at the annual meeting of the American Society of Mechanical Engineers at Philadelphia Dec. 6. The medal is awarded annually for the best original paper presented to the society on a mechanical engineering subject.

At the annual meeting of the society in 1938 Mr. Goldsmith presented a paper on "The High Pressure—High Temperature Turbine Electric Steam Ship 'J. W. Van Dyke'". The J. W. Van Dkye is an 18,100-ton welded oil carrier added to the Atlantic's fleet in 1938. At the time it was built it was the world's largest welded ship. Two other Atlantic tankers of the same class now share this distinction. They are the Robert H. Colley and the E. J. Henry.

Power plant efficiencies not previously approached in this country in marine installations were reported by Mr. Goldsmith in his A.S.M.E. paper following trial runs of the turbine-electric steam tank ship J. W. Van Dyke. Accurate tests showed that the ship used only 0.511 pound of fuel per shaft horsepower for propulsion.

The decision to substitute the turbine-electric drive for the usual diesel engine drive followed considerable analytical work. It was found that 5000 hp. would be required to propel the vessel of 18,100 tons deadweight, including 6,500,000 gallons cargo, at an average speed of 13¼ knots. It was decided that the power promising the lowest overall operating cost per s.hp. was the turbine-electric drive. To meet existing rules of the American Board of Shipping, the Bureau of Marine Inspection and Navigation, and the requirements of economy in general, it was decided that the turbine should be designed for 600-pound pressure, 820° F. steam.

The results have shown that when the price differential between the fuel burned in this turbine-electric steam ship and the fuel required by diesel engines, that there should no longer be controversy relative to the most efficient type of power for this size power plant, Mr. Goldsmith concluded.

Mr. Goldsmith was graduated from Drexell Institute of Technology as an electrical engineer in 1914. Two years later he joined Atlantic's engineering staff as a mechanical draftsman. Subsequently he served as experimental engineer, engineer of tests, technical assistant to the president and consulting engineer. In 1934 he was appointed manager of the company's general engineering and construction department and in 1937 was made chief engineer.

In his various engineering positions Mr. Goldsmith has been in charge of several major construction projects including the company's new 18,000-barrel refinery at Atreco, Texas. He was responsible for the power plants of the three 18,100-ton tank steamers which embody several features new to marine engineering and has supervised the engineering on a numbr of Atlantic pipelines handling both crude oil and finished products.

Mr. Goldsmith is a vice president and director of the Atlantic Pipe Line Co. and a director of Atlantic Oil Shipping Co., both subsidiaries of Atlantic Refining Co.

The Melville medal which will be presented to Mr. Goldsmith is a bequest of Admiral George Wallace Melville who died in 1912. Admiral Melville served as an engineer officer on the Union sloop Wachusett in the War Between the States and later was Rear Admiral, Engineer in Chief and Chief of the Bureau of Steam Engineering of the U. S. Navy. This is the first time since the award was established that it has been presented for a contribution in the field of naval engineering.

Alkylation Plant Costs 8 Times Comparable Cracking Plant

By Jack N. Westsmith
N.P.N. Staff Writer

ALKYLATION is now an aviation fuel process alone it was brought out in a discussion of alkylation and its influence on the utilization of natural gasoline at the annual fall meeting of the California Natural Gasoline Association in Los Angeles, Nov. 17. This conclusion was based on the fact that 100-octane aviation fuel is selling for 15 to 16 cents a gallon at the refinery and that alkylation plants cost about eight times as much as a thermal cracking plant. It was estimated that alkylation plants cost about $2500 per barrel of product. However, by utilization of some existing equipment, it was declared that refiners could reduce the initial expenditure.

Approximately 600 members and interested visitors listened to the keynote paper prepared by E. W. Gard, A. L. Blount, and Dr. K. Korpi, all of Union Oil Co. Mr. Blount presented the paper. The authors estimated that three times as much 100-octane aviation gasoline could be produced annually from olefins now available in California by alkylation than by polymerization and hydrogenation. The product would comply with Army specifications for aircraft fuel.

Estimates were that 2,100,000 barrels of alkylation products could be produced in California each year with 91-octane aviation gasoline output in the neighborhood of 1,-800,000 barrels. By blending with straight-run fractions and containing a maximum of 3 mi. of lead per gallon, about 2,900,000 barrels of 100-octane fuel could be produced per year.

Following this reasoning, it was believed that the potential output of aviation gasoline by the alkylation method was four to seven times the present local annual demand of about 400,000 barrels yearly.

The authors questioned the economy in using alkylation for the manufacture of a blending stock for use with regular motor fuels, pointing to the fact that aviation gasoline with a 100-octane rating was selling for 15 to 16 cents a gallon at the refinery. It was estimated that alkylation plants cost about $2500 per barrel of product, or about eight times the cost of a thermal cracking plant.

By utilization of some existing equipment, it was declared that refiners could reduce the initial expenditure, although the amount of this saving would be dependent upon the extent to which existing facilities could be used.

A comparison was drawn by the authors between alkylation and polymerization to show the course of reaction between the two refining methods, with the point made that the polymers of the olefins could be used as well as the olefins themselves in the alkylation process, and that polymerization could be used to concentrate the olefins for use in the alkylation process.

In a broad introduction to alkylation, the paper indicated the probable course of the reaction, the type of materials that react and the character of the alkylation products. A considerable portion of the paper was given to a description of experimental work carried on by these Union engineers.

In this pilot plant operation, it was shown that three refinery fractions were used as feed stocks: 1, a mixed propylene-butylene from the pressure distillate stabilizer, 2, a propylene-rich feed, and 3, a butylene-rich feed, with the last two prepared from the first by fractionation. Isobutane feed was produced at the natural gasoline stabilizer and contained approximately 80 per cent isobutane and a remainder of propane and normal butane. A variety of feed stocks was used during the tests.

In conclusion, the authors summarized as follows:

1. The alkylation product is uniquely useful in the preparation of high octane aviation fuels.

2. The present market, excluding wartime demand, will consume about one-fifth of the present potential production from the easily recovered olefins and isobutane.

3. The present cost of producing the alkylation product precludes its use in the preparation of regular motor fuels.

4. The cost of an alkylation plant is relatively high per barrel of product.

During discussion of this paper from the floor, Vernon O. Bowles, The Lummus Co., enlarged upon alkylation reactions and offered some answers to reasons for a wide range in alkylate yields, even in excess of the so-called theoretical yield.

The speaker declared "reaction time" and "hydrocarbon loss" were important in this consideration, with the first related to such factors as degree of dispersion and state of agitation, and with the second related to factors such as temperature and isobutane concentration. These various factors were considered as constants in the discussion.

The effect of varying reaction time was declared the subject of considerable research. However, in general it was stated that butylenes or other olefins will react with isobutane completely in a relatively short interval of time (five minutes), but as the time element is extended (30 to 40 minutes), the yield of alkylate invariably increases.

It was pointed out that this was the result of many complex side reactions and further consumption of isobutane which is the only source of this additional yield. The fact that alkylate now produced on a commercial scale from butylene and isobutane contains substantial quantities of isopentanes, isohexanes, and isoheptanes as well as quantities of isoparaffins heavier than iso-octane, was pointed to as further indication of these side reactions. Effect of these reactions on yield were illustrated by a series of hypothetical reactions.

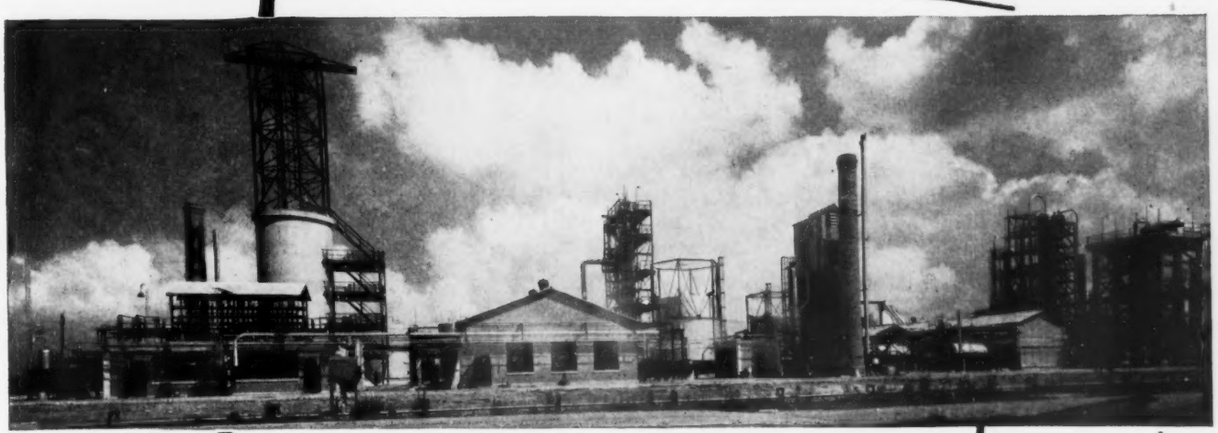
Explanation of the low yields of alkylate obtained in some operations was attributed to solution of the olefin in the acid and carbonization of the olefin. A high olefin loss together with inadequate agitation and resulting insufficient phase contact might explain, the speaker said, yields as low as 150% by weight on the olefin actually charged to the plant. However, it was added that such yields are no longer experienced with increased knowledge and improved operating technique.

In conclusion the speaker pointed out that alkylation is applicable not only to the olefins and butylenes, but to pentene and even higher olefins. He said his company is now designing an alkylation plant which will be charged with 162°-endpoint cracked gasoline and isobutane for the production of approximately 82-octane number (ASTM-CRF) aviation gasoline, indicating the large potential requirement of

(*Continued on page R-519*)

DURING THE PAST 12 MONTHS

Lummus has built . . . in more than 25 Refineries . . . the following types of plants and equipment:



Modern Iso Octane Plant using Polymerization and Hydrogenation.

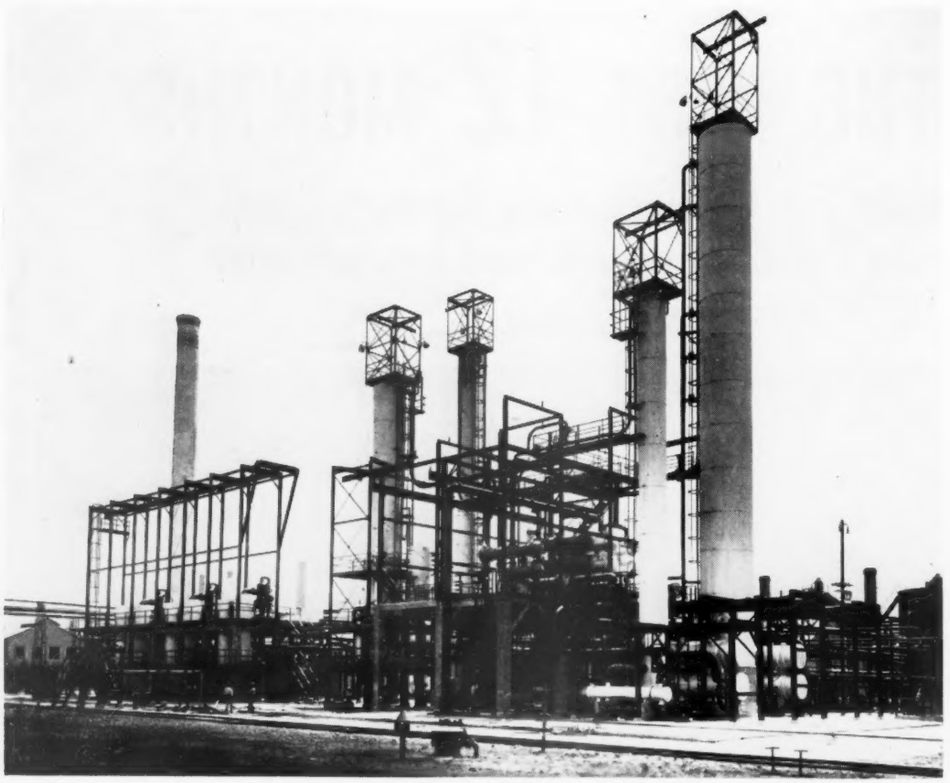
- Iso Octane Plants
- Combination Cracking Units
- Sulfuric Acid Alkylation Plants
- Continuous Coking Units
- Solvent Extraction Plants
- Dewaxing Plants
- Viscosity Breakers
- Reforming Units
- Polymerization Plants
- Hydrogenation Plants
- Gasoline Finishing Plants
- Atmospheric Topping
- Naphtha Re-run Units
- Stabilizers
- Debutinizing Units
- Depentanizer Units
- Deisobutanizer Units
- Deisopentanizer Units
- Depropanizer Units
- Vacuum Units
- Contact Filtration Plants
- Treating Plants
- Vacuum Asphalt Plants
- Emulsion Wax Sweating Process Unit
- Oil Heaters
- Complete Refineries

THE LUMMUS COMPANY, 420 Lexington Avenue, NEW YORK, N. Y.

600 SOUTH MICHIGAN AVENUE, CHICAGO, ILL. • 411 WEST FIFTH STREET, LOS ANGELES, CAL. • BUSH HOUSE, ALDWYCH, LONDON, W. C. 2

LUMMUS

PETROLEUM REFINING PLANTS



Sulfuric acid alkylation plant of The Texas Co. at Port Arthur, Texas

729.7

High-Octane Aviation Gasoline By Sulfuric Acid Alkylation*

A Contribution of
Anglo-Iranian Oil Co., Humble Oil and Refining Co., Shell Development Co., Standard Oil Development Co., and The Texas Co.

ABSTRACT

Aviation fuels with octane ratings approaching 100, or above, are increased greatly in commercial availability, by the introduction of the sulfuric-acid alkylation process.

This process affects directly the union of isoparaffins with olefins in approximately equal volumes to form branched-chain paraffins in the presence of strong commercial sulfuric acid as the catalyst, and in a single-stage operation.

A new source of high-octane gasoline is available; and, with sufficient isoparaffin, potential yields of branched-chain product by alkylation from a given refinery stream are more than double those obtainable by the two-stage process of olefin polymerization followed by hydrogenation.

The alkylation process is unusually well adapted to commercial application, and marks an important step forward in both the petroleum and aviation fields.

BRANCHED-CHAIN paraffins are outstandingly valuable as aviation fuels, as is evidenced by the increase in their consumption for making 100-octane gasoline. A new method of utilizing the light hydrocarbons exists in which the paraffin is combined directly with the olefin to produce a saturated fuel, thus avoiding the two stages of polymerization and hydrogenation. Recently it has been shown that sulfuric acid is a catalyst for the reaction.

The present sulfuric-acid alkylation process represents the combined efforts of the Anglo-Iranian, Humble Oil, Shell Development, Standard Oil Development, and Texas research staffs. In order that a major new source of high-octane aviation fuel should be made available for national defense without delay or waste of correlative experience, their efforts recently have been combined to expedite the commercial application of the process.

Principles of Operation

When aliphatic olefins are mixed with strong sulfuric acid at around atmospheric temperatures, the primary reaction is one of olefin absorption in the acid to form alkyl sulfates. This absorption is a relatively rapid exothermic reaction. Saturated normal hydrocarbons remain virtually unabsorbed, but isoparaffins such as isobutane are absorbed to a slight extent if the sulfuric acid is at a concentration of 90% or higher. It has been estimated that the rate of absorption of the olefins is about 700 times faster than that of the isoparaffins.

*A condensation of a paper presented under the title, "High-Octane Aviation Fuel by the Sulfuric-Acid Alkylation Process," at the 20th Annual Meeting of the American Petroleum Institute in Chicago, Nov. 17, by S. H. McAllister, Shell Development Co.

In order to prevent the absorption step from proceeding to a point where the acid becomes useless for coupling, it is desirable to have present in the reaction zone a vast excess of isoparaffin. In batch studies, this mass effect of the isoparaffin is achieved by adding slowly the olefin to an emulsion of the isoparaffin and sulfuric acid. When the rate of addition is kept sufficiently slow to prevent any accumulation of unreacted olefin in the reactor, a completely-saturated product is obtained. However, much faster overall reaction rates and better control of the reaction can be obtained by continuous operation.

In continuous operation, the suppression of the extent of olefin absorption is achieved first by diluting the olefin feed with isoparaffins, and then adding this mixture to an emulsion of acid and reacted hydrocarbon which is rich in isoparaffins, but substantially olefin-free. In commercial plants, the requisite mixing is obtained by the use of a circulating pump and additional reaction space in which intimate contact is maintained by the velocity of flow through baffles or jets. A simplified flow diagram of a commercial plant is given in Fig. 1.

Modifications of these single-stage reactors, of course, are possible, and in certain instances may lead to improved results. Additional reactors may be arranged in parallel or in series, and the feed may be split between the reactors.

Sulfuric acid is the only chemical agent used, although a caustic wash of the product usually is provided to neutralize any traces of acid which might be carried over from the separator to the fractionation system. In commercial operation, a portion of the acid continuously is withdrawn from the separator, and replaced by makeup acid of 96% to 100% strength. This replacement is essential if the quality of the product is to be maintained, as otherwise side reactions gradually would weaken the acid to a point where it no longer efficiently could catalyze the alkylation reaction.

The acid usually is withdrawn at from 88% to 90% titratable acidity. The drop in acidity is due largely to the absorption of hydrocarbons in the acid—although contamination by products from oxidation and other side reactions are contributing factors. This dilution effect is by no means equivalent to water dilution, because 90% sulfuric acid, in which water makes up the other 10%, is entirely unsuitable for alkylation.

The amount of acid added usually is referred to as acid replacement, and is a major factor in determining the efficiency of operation. The quantity added is affected both by the composition of the feed stocks and by the operating conditions used. Strictly speaking, the acid is not consumed in the chemical sense, but merely is diluted by the hydrocarbon. A major part of the acid can be recovered by conventional reconcentration methods, or it can be used for acid treating elsewhere in the refinery.

Feed Stocks

Alkylation can be carried out with a wide variety of olefins and isoparaffins, but for all practical purposes olefins from C_3-C_5, inclusive; and the isoparaffins, isobutane and isopentane, are those used. Ethylene-containing feed stocks may be used, but the reaction is accompanied by an increased acid consumption. Olefins above C_5 yield products boiling largely above the aviation-gasoline range. However, it has been found that some C_4 and C_5 polymers containing eight or more carbon atoms prepared by catalytic process and some other olefins of branched structure rearrange on alkylation to yield products boiling below those expected, and predominantly in the gasoline range.

Isobutane is the most-widely used isoparaffin; because, on account of its high volatility, it has a restricted direct use in gasoline. When coupled with olefins, it leads to products having a highly-branched structure. Isopentane and isohexane are in themselves valuable constituents of gasoline, and would be used only in the alkylation process if large quantities were available over and above those required to meet volatility requirements.

Isobutane is alkylated readily by most of the pure olefins, and with a low catalyst consumption. Unfortunately, in the refinery the olefins are present in mixtures along with dienes, aromatics, mercaptans, thiophenes, and other substances. These may affect markedly the yield and acid consumption; as in the laboratory it has been shown that mercaptans, amines, dienes, aromatics, and oxygenated compounds are absorbed by the acid, and reduce its activity rapidly.

S. H. McAllister, Shell Development Co., was chosen to represent the five companies who developed sulfuric acid alkylation by presenting the A.P.I. paper because of his familiarity with the subject. He has been with Shell since receiving his M.A. from Stanford University in 1930

The cost of pretreating the feed to remove these impurities must be weighed against the resulting economy in acid. For example, the oxidation of the sulfur compounds causes an increase in consumption of acid, but does not affect directly the quality of the product. A simple caustic wash, therefore, usually is warranted. Amines, if present, can be removed by water washing. Dienes,* aromatics, and oxygenated compounds, however, are more difficult to remove; and it is doubtful if a pretreatment process is justified. Entrained water is removed by settling, but the quantity of dissolved water present hardly justifies much expense in predrying the feed. Thus, each feed stock con-

*Butadiene will alkylate to give octanes, but the acid consumption is high.

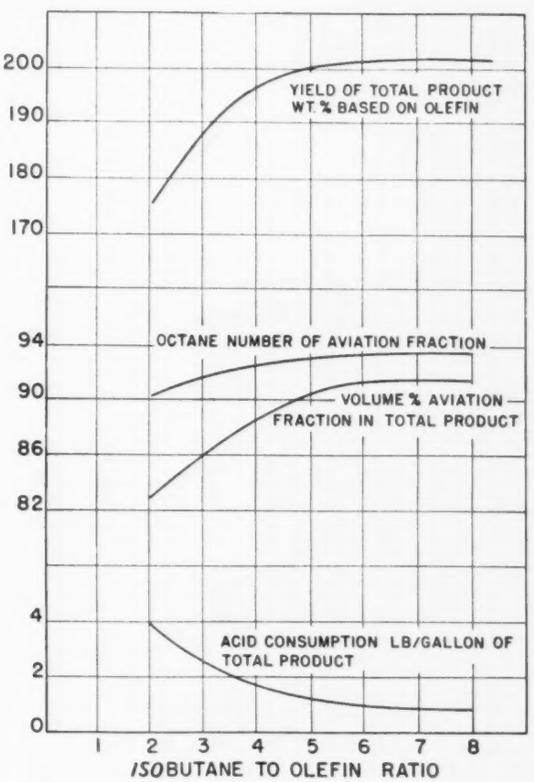


Fig. 2. Isoparaffin-olefin mole ratio has a marked influence on the acid life and on the yield and quality of product. The higher the ratio, the better the results

TABLE 1

Alkylation with Representative Refinery Olefin Feed Stocks

Olefin Feed Stock (Per Cent by Weight of Olefin)	C_3 Fraction from Cracking 30*	C_4 Fraction from Cracking 48†	Residual C_4 Fraction from Isooctane Manufacture 24‡	C_5 Fraction from Cracking 55	70° to 160° F. End-Point Cracked Gasoline 52	70° to 210° F. End-Point Cracked Gasoline 50
Conditions:						
Isoparaffin used	Isobutane	Isobutane	Isobutane	Isobutane	Isobutane	Isobutane
Mole ratio of isoparaffin to olefin	8	5	5	8	8	8
Makeup acid strength, per cent by weight of sulfuric acid	98–100	98–100	98–100	98–100	98–100	98–100
Volume ratio of acid to hydrocarbon ratio	1	1	1	1	1	1
Temperature, deg. F.	85	32–50	32–50	50	50	50
Contact time, min.	20–40	20–40	20–40	20–40	20–40	20–40
Titratable acidity of rejected acid, as per cent by weight of sulfuric acid	88–90	88–90	88–90	88–90	88–90	88–90
Per cent by weight of yield of total alkylate based on olefin in feed	185	190–200	200–215	134§	126§	115§
Per cent by volume of total alkylate based on olefin in feed	138	158–166	168–180	125§	119§	113§
Aviation fraction (end point, 300° F.) in total alkylate, per cent	92–95	88–90	89–91	90	85	77
Makeup acid, lb. per gal. of total alkylate	2.6	1	<1	1.5	1.7	3.3

*With mixed C_3 and C_4 fractions, materially better results are obtained.
†About 18 per cent isobutylene present.
‡Largely butylene-2.
§Yield based on total refinery fraction, which includes saturates.

stitutes a separate problem depending on the amount and type of impurity present, and may require adjustment of the operating conditions over and above the adjustments necessary when operating with different pure olefins.

Effect Of The Operating Variables

In view of the fact that the actual concentration of olefin in the reaction zone is so low that under practical operating conditions it cannot be measured, it is necessary to consider the alkylation reaction from a study of the following interdependent variables: isoparaffin-olefin ratio, contact time, acid strength, temperature, acid-hydrocarbon ratio, olefin concentration of the feed, agitation.

The higher the isoparaffin-olefin mole ratio in the hydrocarbon feed stock prior to contact with acid, the better the results obtained. This is shown in the case of an isobutane-C_4 olefin feed in Fig. 2; the other operating conditions were constant for this series of experiments. It will be seen that there is a marked increase in the total yield, per cent of aviation fraction, and octane number of the product, and a corresponding decrease in the acid consumption, as the isoparaffin-olefin ratio is increased from 2:1 to 5:1. A 5:1 ratio, therefore, usually is chosen as the lowest ratio for commercial operation with C_4 olefins.

These high ratios are obtained by blending the olefin feed and the required makeup isobutane with isobutane recovered from the fractionation system. The reaction is quite fast, and high production rates are attained in the reaction systems developed. Contact times as low as 5 min. have been used with C_4 fractions, although 20 min. to 40 min. have been allowed in the design of commercial plants.

Under usual operating conditions, the acid in the reactor has a titratable acidity of 88% to 90%, and is maintained at this strength by the addition of makeup acid. The effect of temperature closely is associated with acid strength, and differs with different olefin feed stocks. With C_4 olefins, lower temperatures appear to favor catalyst life, and the optimum temperature in this case lies between 32 and 50° F.

The volume ratio of acid to hydrocarbon in the reaction zone, for most purposes, is about 1:1; but in specific instances it may be as high as 2:1. Variations within this range are not critical, but higher or lower ratios give poorer results.

In order to reduce equipment sizes and the acid consumption as much as possible, it is desirable to have the olefin concentration reasonably high. With average C_4 fractions from cracked gasoline as the olefin feed stocks, and with a 5:1 isobutane-olefin ratio, the olefin concentration will vary from about 8% to 14%.

Very early in the development of the process it was found that excellent agitation was essential for good results. It was found that best intimate contact was obtained by means of a pump-recycling-acid-hydrocarbon emulsion through a system of jets or baffles. This method, therefore, has been adopted uniformly for commercial installations.

Characteristics of Products

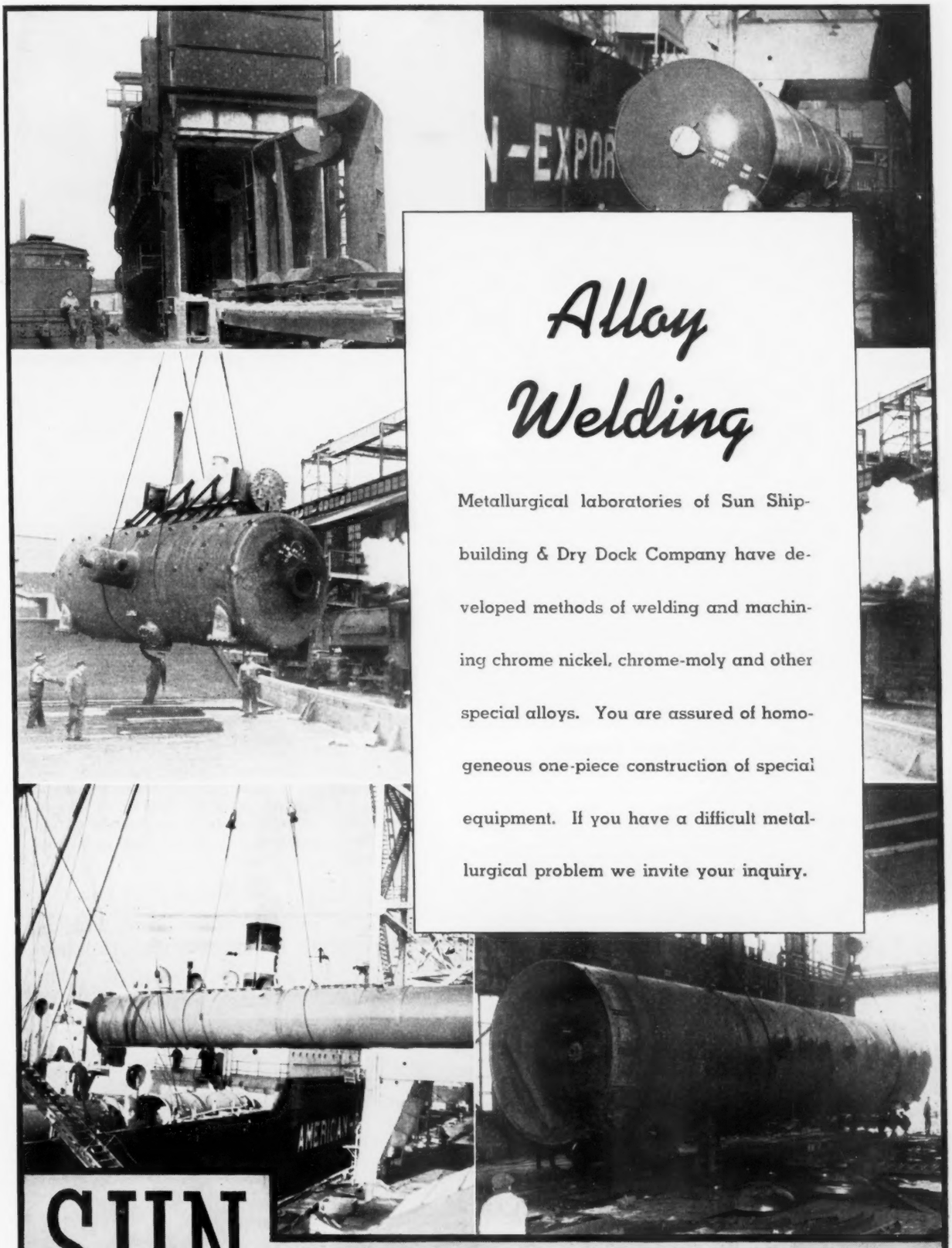
The products are particularly suitable as aviation fuels because of their isoparaffinic nature, high octane number, high lead susceptibility, very low sulfur content, high

TABLE 2

Properties of Products from Alkylation with Representative Refinery Olefin Feed Stocks

Olefin Feed Stock	C_3 Fraction from Cracking	C_4 Fraction from Cracking	Residual C_4 Fraction from Iso-octane Manufacture	C_5 Fraction from Cracking	70° to 160° F. End-Point Cracked Gasoline	70° to 210° F. End-Point Cracked Gasoline
Isoparaffin Used	Isobutane	Isobutane	Isobutane	Isobutane*	Isobutane*	Isobutane*
Properties of total alkylate (C_5-free):						
Gravity, deg. A.P.I.	72.1	69.2	69.2	76.6	72.1	70.6
Bromine No., g. of bromine per 100 ml.	0.1–0.4	0.3–0.5	0.3–0.5	0.5–1.0	0.5–1.0	1–2
Sulfur, per cent	0.001	<0.001	<0.001	<0.005	<0.005	<0.005
Reid vapor pressure, lb. per sq. in.	4		3	8		
Octane No. (A.S.T.M.-C.F.R.)	88.0	91.5	92.5	87.0	83.0	79.0
A.S.T.M. Distillation, in Deg. F.						
Initial boiling point	152	120	117	108	126	128
End point	387	403	378	446	455	414
50-per-cent point	194	222	225	242	220	220
90-per-cent point	271	267	250	306	316	328
Recovery, per cent	98	99	98.5	99	98	98
Recovered at 266° F., per cent	88	89.5	92	79	76	70
Properties of 300° F.-end-point fraction:						
Unsaturation, per cent	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Sulfur, per cent	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
50-per-cent point, deg. F.	190	220	221	209	200	205
Reid vapor pressure, lb. per sq. in.		3.5	3.0	9.0	11.6	7.4
Octane No. (A.S.T.M.-C.F.R.)	89	92	93	87	82	78

*Products not depentanized.



Alloy Welding

Metallurgical laboratories of Sun Shipbuilding & Dry Dock Company have developed methods of welding and machining chrome nickel, chrome-moly and other special alloys. You are assured of homogeneous one-piece construction of special equipment. If you have a difficult metallurgical problem we invite your inquiry.

SUN

SHIPBUILDING & DRY DOCK CO.

CHESTER, PENNSYLVANIA

calorific value, and lack of sensitivity to different engine conditions.

With the exception of the alkylation product from a gasoline of 210° F. end point, products of isobutane and the lower olefins boil almost entirely in the gasoline range; from 85% to 90% boils below 300° F. In Table 1 a few representative feed stocks have been selected, and the operating conditions and yields to be expected are given.

The operating conditions given in Table 1 are typical for these feed stocks. However, they do not represent necessarily the best results which have been obtained.

The ASTM distillation and other data pertinent to the evaluation of these products for aviation fuels are given in Table 2. It will be seen that both the total product of the reaction and the aviation fraction derived from it are substantially sulfur-free and saturated. Even when cracked gasolines of high sulfur content are used as feed stocks. Samples of alkylation products have been exposed to strong sunlight for months without recognizable discoloration or gum formation.

All of the alkylation products given in Table 2 are excellent blending stocks for 100-octane aviation fuels. Their composition may vary widely, depending on the base stock used and the alkylate chosen. For illustrative purposes, one such blend prepared from 50% of C_4 aviation alkylate and 50% of 77-octane straight-run gasoline base stock is given in Table 3. Similar blends may vary over the range of 40% to 70% of aviation alkylate, depending on the properties of the stocks.

A large percentage of the alkylation products can be prepared to meet the volatility requirements of aviation fuels, without blending. Therefore, when there is a demand for fuels having anti-knock properties superior to unleaded iso-octane, these super fuels can be made from selected alkylation fractions by leading.

The alkylation products boiling above the normal aviation range also have high octane values and good lead susceptibilities, and thus ideally are suited for use when, in addition to these desirable properties, low volatility is required.

TABLE 3

Characteristics of 100-Octane Aviation Gasoline

Gravity, deg. API	71.8
Octane No., clear (ASTM-CFR)	85
Octane No. plus 3 ml. tetraethyl lead (Army)	100
Copper-dish gum, mg. per 100 ml.	1
Acid heat, deg. F.	2
Freezing point, deg. F.	Below —76
Reid vapor pressure, lb. per sq. in.	7
50-per-cent point, deg. F.	207
End point, deg. F.	308

Commercial Aspects

One of the basic factors to be considered in the installation of a commercial alkylation plant is the availability of the isoparaffin, and in most cases this is the factor limiting the capacity of a given plant. With a given supply of isoparaffin, an approximately equal amount of olefin can be converted by alkylation. In Table 4 a comparison is given for the different processes when using a C_4 fraction from cracking. It will be seen that the yield of 87-octane unleaded aviation gasoline is markedly greater by alkylation.

With other olefin feed stocks, alkylation is even more advantageous. Whereas the alkylate from propylene has an octane number of 88, catalytic polymerization of propylene leads to a polymer of relatively low octane number which, on hydrogenation, is degraded further. Catalytic polymerization of C_5 or higher olefins is not commercial.

The sulfuric-acid alkylation process is basically a new development. However, the equipment employed is of standard type, and its practicability is demonstrated amply by the fact that similar equipment has been used for the manufacture of iso-octanes by the hot-acid and cold-acid processes for nearly five years without any major replacements being necessary. Also, as the sulfuric acid used as the alkylation catalyst is of high concentration and the plants are operated at below atmospheric temperature, corrosion is negligible—and steel equipment can be used

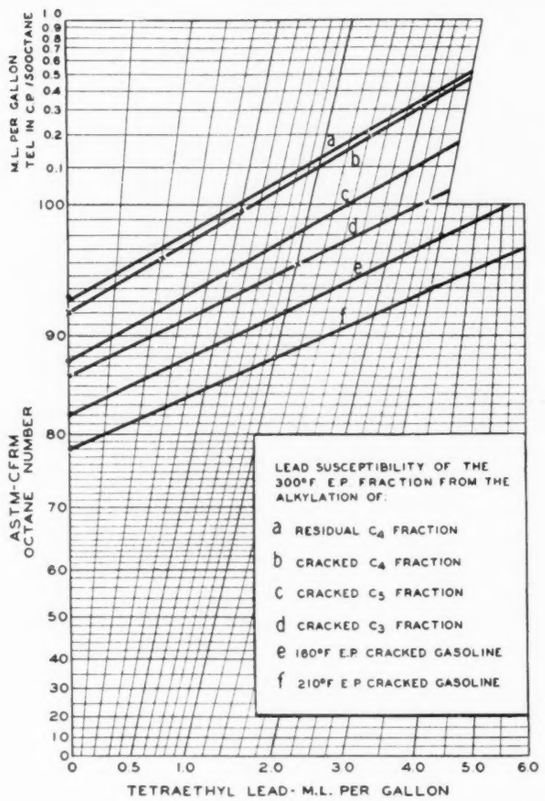

M.L. PER GALLON TEL IN C.P. ISOOCTANE
ASTM-CFRM OCTANE NUMBER
TETRAETHYL LEAD- M.L. PER GALLON
LEAD SUSCEPTIBILITY OF THE 300°F E.P. FRACTION FROM THE ALKYLATION OF:
a RESIDUAL C4 FRACTION
b CRACKED C4 FRACTION
c CRACKED C5 FRACTION
d CRACKED C3 FRACTION
e 180°F E.P. CRACKED GASOLINE
f 210°F E.P. CRACKED GASOLINE

Fig. 3. Lead susceptibility of the 300°-F.-end-point fraction from alkylation. Gasoline fractions after alkylation have such a greatly-improved lead response that it is possible to produce 95-octane gasoline with moderate amounts of lead

throughout. The auxiliary fractionating equipment is of standard type, and presents no difficulties in design and construction. Thus no new nor very troublesome engineering principles are encountered.

Alkylation development has been extremely rapid, and at present there are six commercial plants in operation, and a number of plants under construction. A list of these plants, together with their rated capacities, is given in Table 5. Photographs of two plants now in operation are shown herewith.

TABLE 4

Comparison of Alkylation and Polymerization for C_4 Fraction from Cracking

(Basis, 1 Gal. of Feed)

Feed composition, per cent by volume:

Propane	1
Isobutylene	18
nButylenes	30
Isobutane	9*†
nButane	42
Total	100

Method Used	Cold-Acid Absorption and Polymerization Plus Hydrogenation	Catalytic Polymerization Plus Hydrogenation*	Catalytic High-Pressure Polymerization Plus Hydrogenation†	Alkylation
Additional isobutane, gallons per gallon of feed	Nil	Nil	Nil	0.42
Product‡ boiling below 300° F., gallons	0.11	0.25	0.32	0.73
Octane No. of saturated aviation cut (ASTM-CFR)	99-100	96-98	91-93	92-94
Gallons of 87-octane fuel per gallon of feed prepared by blending aviation cut with 72-octane base stock§	0.21	0.42	0.43	1.02

*Either UOP or hot-acid process operating for maximum octane number.
†Operating for maximum yield.
‡Data are approximate. The yield depends somewhat on operating conditions.
§Assuming straight-line function and motor-method octane numbers.
*†In general, refinery streams are richer in isobutane.

High Quality Aviation Fuel Base Is Houdry Reforming Objective†

By A. G. Peterkin,* J. R. Bates* and H. P. Broom*

ABSTRACT

Importance of a suitable base stock for aviation fuel as well as high-octane blending materials is important while the supply of these materials is limited or of relatively high cost. Houdry catalytic reforming takes low-grade naphthas and raises their octane number and response to tetra-ethyl lead, makes them sufficiently stable to prevent gum formation or oxidation products and sufficiently low in sulfur content to prevent corrosion, brings vapor pressure to suitable limits, and produces the proper hydrocarbon composition to give necessary combustion characteristics.

INASMUCH as the availability of aviation fuel blending agents and materials such as iso-octane, isopentanes or alkylates is limited, the base gasoline should be highly susceptible to their addition as well as to tetra-ethyl lead and have other characteristics necessary to aviation fuels. While the supply of straight-run gasolines and naphtha is unlimited, only certain ones have sufficiently high octane rating to be suitable for aviation-base stock.

Even though the number of units capable of supplying iso-octane and alkylates has increased greatly, the cost of producing such materials to improve straight-run aviation fuels to the necessary extent must be examined carefully. The Houdry catalytic-reforming operation has been developed as a partial solution to this problem. Present total plant capacity in this country and France is 25,000 barrels per day.

The charge, either a gasoline with a final boiling point of 400-500° F., or a naphtha boiling at 250-500° F., is pumped through heat exchangers to a still, wherein it is vaporized and heated to 850° F. The vapors pass directly to the catalyst chambers; thence, after passing through the catalyst flow, through heat exchangers to a fractionating tower, and are separated into aviation gasoline, naphtha, gas oil, and gas. All equipment is a duplicate in type of that used in operating Houdry units processing gas oils and residual fuels for motor gasoline.**

A Houdry catalytic-reforming plant, without change, may be used to produce motor gasoline from naphtha, or may charge gas oil at decreased throughput to produce either aviation or motor gasoline. For example, when charging East Texas or Coastal naphthas, the throughput rate is two volumes of oil (measured as liquid) per hour per one volume of catalyst; whereas when charging gas oils the rate is one volume of oil per volume of catalyst. The catalyst employed in this operation is a highly-active hydrosilicate of alumina. Such a catalyst costs approximately $25,000 for a plant charging 10,000 bbl. of naphtha per day, and its life is not less than 180 stream-days.

The cost of installing an 8500-bbl.-per-day unit is approximately $1,225,000 within the battery limits, excluding royalty. A 10,000-bbl. unit is being installed on an exist-

*Houdry Process Corp., Wilmington.

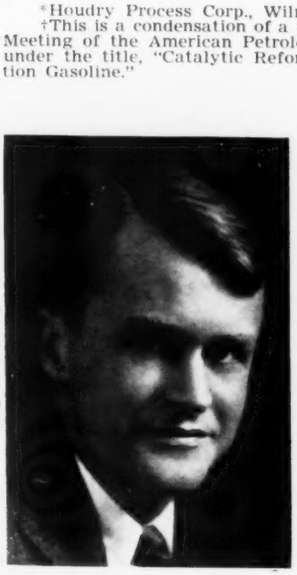
†This is a condensation of a paper presented at the 20th Annual Meeting of the American Petroleum Institute in Chicago, Nov. 17, under the title, "Catalytic Reforming for the Production of Aviation Gasoline."

**For Houdry unit operation see NATIONAL PETROLEUM NEWS, Aug. 23, p. R-346-68.

TABLE 1

Aviation-Gasoline Yields

Charge to Plant—Per Cent of Crude:	Straight-run Naphtha—Grade "B" Coastal Crude (Gravity, 29.7 Deg. API) 30.9 (Initial)	Heavy Naphtha—East Texas Crude 19 to 39
Aviation gasoline, per cent by volume	58.8	32.5
Motor naphtha, per cent by volume	18.8	
Cracked gas oil, per cent by volume	9.1	53.0
Dry gas, per cent by weight	13.1	13.7
Catalyst deposit, per cent by weight	2.3	2.4



John R. Bates, who presented the accompanying paper, left an associate professorship at the University of Michigan in 1936 to join Houdry. He became National Research Fellow at Johns Hopkins University after taking the Ph. D. at Princeton in 1927, then Fellow of International Education Board in Berlin. He is author of some 30 papers in theoretical chemistry

A. G. Peterkin joined Houdry Process Corp. in 1935 and is now vice-president of the Catalytic Development Co. in charge of research and development laboratories. He was born in England in 1881. He spent 11 years as manufacturing manager of the chemical department of The Barrett Co. then several years with The Atlantic Refining Co. as development engineer

TABLE 2
Inspection of Charge and Products*

	Grade "B" Coastal Naphtha				East Texas Naphtha		
	Charge	Aviation Gasoline	Motor Naphtha	Catalytic Gas Oil	Charge	Aviation Gasoline	Catalytic Heavy Naphtha
Gravity, deg. A.P.I.	46.8	60.1	39.5	25.2	46.2	64.0	41.7
A.S.T.M. Distillation, in Deg. F.:							
Initial boiling point	154	104	311	412	282	104	314
5-per-cent point	206	130	317	424	302	120	331
50-per-cent point	334	212	340	454	366	198	368
90-per-cent point	435	276	380	544	424	288	445
End Point	464	328	416	694	454	334	597
Recovery, per cent	98	98	98	98	98	97	98
Residue, per cent	1.0	0.8	0.6	1.6	0.8	0.9	...
Color, Saybolt	18	30	...	...	30	30	...
Sulfur, per cent by weight	0.03	0.01	0.01	0.07	0.02	0.01	...
Acid heat, deg. F.	...	13.5	...	...	...	24	...
Reid vapor pressure, lb. per sq. in.	2.4	7.0	0.1	...	...	7	...
Doctor test	Sour	Slightly sour	...	...	..	Slightly sour	...
Octane No., A.S.T.M. motor method	57.2	77.6	70.9	...	34.7	77.7	...
After addition of tetraethyl lead:							
3 ml. per gal.	...	90.5	...	...	..	92.5	...
6 ml. per gal.	...	95.0	...	...	...	96.0	...

Low gum is checked by 5 tests.

* The gasolines whose properties are given in this and subsequent tables dealing with Houdry processing are raw, as condensed and stabilized, without further treatment.

ing pipe still at a cost of $862,000—the heater, fractionating equipment, and control house of the old unit being utilized.

The direct cost of operation is normal to thermal reforming. The fuel requirement is less than for thermal reforming. Net power consumption is about the same, as the power for the air compressor is supplied by the regeneration operation. Number of operators per shift is the same as for a similar thermal operation. Maintenance is estimated at 3% of the capital investment per year.

Depreciation is in excess of a thermal reformer to the extent that the capital cost of the catalytic equipment exceeds that of a thermal unit. Considering the quality of the products obtained, the cost per unit of product is believed to be highly favorable as compared to thermal reforming.

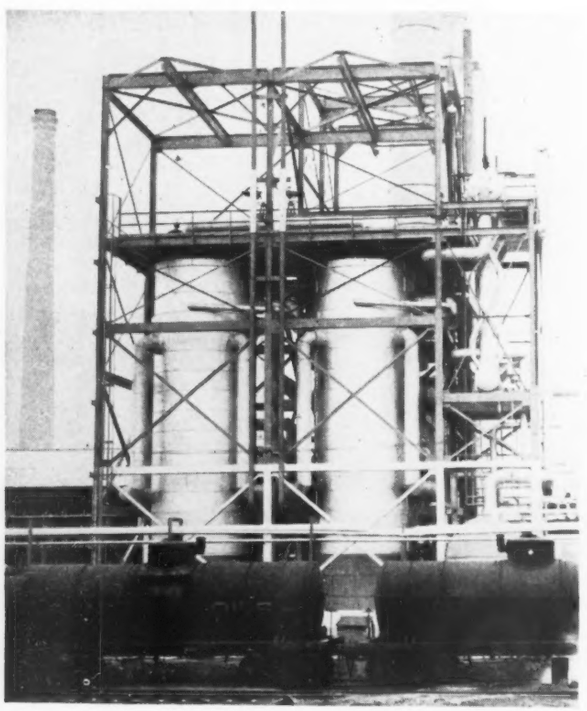
Yields and Product Characteristics

The distillation range of the charging stock for reforming depends upon the type of crude. When charging stocks such as East Texas naphtha, the light ends are removed to give the naphtha an initial boiling point of 280-350° F., and an end point of 400-500° F. For naphthas from highly-naphthenic crudes, the range is from an initial of 90° F. to a final of 500° F. Table 1 shows the product yields from two such charging stocks.

Table 2 shows the characteristics of the charging stocks and products corresponding to the yields given in Table 1.

The yields of aviation gasoline shown in Table 1 are based upon European aviation specifications, which call for 90% evaporated at 293° F. To meet U. S. specifications of 90 per cent at 257° F., these yields must be decreased correspondingly.

Table 2 shows the high susceptibility to lead character-



Houdry reforming unit at Sun Oil Co. refinery, Marcus Hook, Pa.

TABLE 3
Blending with Commercial Isooctane

	Per Cent of Commercial Isooctane Necessary to Blend to 100-Octane U. S. Army Method		
Tetraethyl lead per gallon, ml.	3	3.75	4
Houdry aviation	30	23	20
Straight-run aviation	50	..	..

TABLE 4
Reforming Naphtha to Produce Motor Fuel

	Grade "B" Coastal Naphtha	East Texas Naphtha	West Texas Naphtha
Rate of charge to catalyst, liquid volume of oil per volume of catalyst	2.25	2.0	3.8
Inspection of Charge:			
Gravity, deg. A.P.I.	46.8	50.4	59.2
A.S.T.M. Distillation, in Deg. F.:			
Initial boiling point	154	245	110
10-per-cent point	224	268	170
50-per-cent point	334	308	250
End point	464	413	414
Sulfur, per cent by weight	0.03	0.02	0.21
Octane No., A.S.T.M. motor method	57.2	43.4	53.2
After addition of tetraethyl lead: 1 ml. per gal.	67.8	51	61.3
3 ml. per gal.	76.0	64	69.0
	...	70.5 (6 ml.)	71.4 (4 ml.)
Yields:			
Total liquid, per cent by volume	92.5	94.1	95.1
Gasoline, per cent by volume	83.4	90.4	93.6
Inspection of Gasoline:			
Gravity, deg. A.P.I.	57.8	57.5	63.0
Initial boiling point, deg. F.	104	94	96
10-per-cent point, deg. F.	160	166	136
50-per-cent point, deg. F.	256	284	227
90-per-cent point, deg. F.	352	358	324
End point, deg. F.	392	390	383
Octane No., A.S.T.M. motor method	76.5	61.8	63.5
After addition of tetraethyl lead: 1 ml. per gal.	83.5	72.4	73
1.5 ml. per gal.	85.1	74.5	75.2
3 ml. per gal.	88.5	79.9	80
Reid vapor pressure, lb. per sq. in.	10	11	9
Sulfur, per cent by weight	0.01	0.01	0.01
Color, Saybolt	30	30	30
Copper-dish gum, mg. per 100 ml.	1	1	4
Oxygen-bomb induction period, hours	10+	10+	10+

istic of this aviation-base gasoline. If in the case of the product from East Texas naphtha it is desired to reduce the acid heat, it may be brought to 15° F. with 3 lb. of acid per barrel, with a 3% loss. This gasoline has demonstrated the important ability to retain its anti-knock quality substantially unchanged.

Catalytic gasoline does not rely on a high concentration of aromatics for its high octane. Much of the good octane value is due to the high isoparaffin content of the gasolines.

Table 3 shows the susceptibility of Houdry aviation gasoline to blending with isooctane.

Table 4 shows results obtained when using a Houdry unit as a reformer for the production of motor fuel. It will be noted that the results are obtained at different rates through the catalyst, and that all the rates are high. In each instance lower rates would give higher octane rating, and lower yields of gasoline. In all cases a high yield of highly-stable gasoline of excellent color, low gum and sulfur, and high lead susceptibility is obtained.

Alkylation Plant Costs 8 Times Comparable Cracking Plant

(*Continued from page R-510*)

isobutane for production of aviation motor fuel by this process.

C. C. Moore, Union Oil Co., in a paper on "Future Review of Past Developments," projected himself into the year 2000 A. D. and, basing his remarks upon the opinions of research by automotive engineers of today, predicted the design of tomorrow's automobiles would provide additional demand for the hydrocarbon fractions found in natural gasolines.

In a Buck Roger's preview, the speaker saw a trend toward reduction in cylinder diameters, increase in engine speed—9000 rpm, use of superchargers, elimination of spark plugs and the conventional carburetors—in favor of first, inlet manifold injection and then to individual cylinder solid injection—and an improvement in motor fuel to obtain upward of 150-octane rating and having a vapor pressure of around 30 pounds per square inch at 100° F., with the fuel handled under pressure and a resultant elimination of the fuel pump.

To the refiner in the year 2000, the speaker believed it would seem incomprehensible that propane and isobutane which would be almost the only naturally occurring hydrocarbons used in automotive fuels at that time, were removed at considerable expense from natural gasoline before blending it in 1940 motor fuels.

Included among other papers presented at the meeting were two by Dr. W. J. Podbielniak, consulting engineer, one on "Advances in Analytical Fractionation Technique" and the other on "The Centrifugal Super-Contactor."

Refinery Employment Gaining W.P.A. Survey Shows

"Both short- and long-time prospects seem to favor increased employment opportunities in refining, but the demand will be increasingly for skilled and semiskilled workers and for technicians," it is stated in a newly published 350-page survey of "Petroleum and Natural Gas Production" by the Work Projects Administration.

It is pointed out that large savings of labor are possible at the modern combination plants and in lubricant plants employing solvent extraction but that expanding polymerization capacity and the trend toward manufacture of an increasing variety and volume of chemical products from petroleum gases probably will more than counterbalance these influences. Also a beginning has been made in utilizing crude oil as a raw material in the manufacture of important chemicals.

Broadly speaking, the long-time trend of employment in petroleum refining corresponds closely with that for crude oil production. A period of rapid relative growth of employment which took place before 1880 was followed by a slower increase which marked the next quarter of a century. In 1904 there were 16,770 wage earners employed at refineries, the report states. During the second decade of the present century the number of wage earners was more than trebled and employment continued to expand during the post-war decade but at a much less rapid rate. The trend, however, was steadily upward and by 1929 the average number of wage earners employed in petroleum refining was 80,596.

Employment declined during the depression but less sharply than in almost any other major unit of the industry. The number of workers employed by refineries in November, 1932—the depression low—was 78 per cent of the 1929 average. Recovery was rapid and by 1935 the number of wage earners was only slightly short of the predepression peak. An all-time record of 83,183 wage earners was reached in 1937. The number of man-hours worked in that year, however, was 28 per cent less than in 1929, it is pointed out.

The output per man more than quadrupled between 1880 and 1909, using refinery throughput of crude oil per man-year as an approximate indicator of worker output. The upward movement of output per man was checked during the war decade but was resumed again after 1919. By 1929 throughput of crude per man-hour was 4.6 barrels, a gain of 92 per cent over 1919. Additional increases in output per man-hour were made during the depression years and in 1937 the throughput per man-hour was 7.6 barrels, an increase of 65 per cent over 1929 and more than three times the 1919 average. Since the trend in worker output does not consider the tendency toward greater variety and high quality of end products, these figures are said to be a highly conservative measure of the increase in output per man-hour that has taken place.

A large portion of the report deals with technological advances in producing, refining, and transportation methods since the beginning of the industry.

Sweetening Technique Improved In Solutized Caustic Method

Complete sweetening of sour gasolines is achieved by extracting them with caustic solutions containing a suitable organic solvent or salt which acts as a solubility promoter, known as a solutizer. A large number of materials have been tested as solutizers and several have been found to be suitable for commercial scale operation. Of these the salt of isobutyric acid is outstanding.

The regeneration step in the solutizer process for extraction of mercaptans was presented in a paper by D. L. Yabroff, E. R. White, and A. V. Caselli at the recent meeting of the American Petroleum Institute. Values of a stripping constant were presented showing its relation to steam requirement. The spent solutized caustic solution is regenerated by stripping with steam and can be used indefinitely to sweeten further quantities of gasoline, Mr. Yabroff said. Establishment of the optimum design and operating conditions of a given solutizer plant is aided by computation of stripping constants for various pure mercaptans and of steam required for regeneration.

Treatment of sour gasolines with aqueous caustic solutions, in general, does not remove the mercaptans completely enough to produce doctor-sweet products, because the heavier mercaptans are very difficult to extract.

Previous work has shown that this is due to the partition of the un-neutralized mercaptan in the aqueous caustic phase dropping off as the molecular weight increases. In order to counteract this effect, the solvent power of the aqueous-caustic phase is improved by incorporating therein certain organic solvents or salts.

In earlier experiments, gasoline was sweetened by contacting it counter-currently with solutizer solution through a system of mixing and settling stages. Now a packed tower is used successfully for the extraction step. The process is thus a simple cyclic one, comprising an extraction and a stripping (regeneration) step, Yabroff said.

Dehydrogenation Polymerization Hydrogenation

New Catalytic Process Adds To Potential Motor Fuel Supply†

By A. V. Grosse*, V. N. Ipatieff*, Gustav Egloff*, and J. C. Morrell*

ABSTRACT

Catalytic dehydrogenation, a new process of which there are now three commercial plants under construction, has been developed to convert gaseous paraffins, except methane, into the corresponding olefins and hydrogen. The olefins then serve as raw material for the polymerization process. Where high-octane aviation gasoline is the objective, selective polymerization followed by the hydrogenation step would be employed.

Aristid V. Grosse, Universal Oil Products Co., is known for his isolation of the element protactinium in 1927. Since 1932 he has worked with V. N. Ipatieff on catalytic reactions of hydrocarbons. Mr. Grosse was born in Russia, grew up in the Far East, and received has scientific education in Europe, mainly Germany. He received the Dr. ing. degree at the Technische Hochschule of Berlin in 1927

CATALYTIC dehydrogenation of n- and isobutane and of propane is a highly selective reaction and produces 85-95% of the theoretical yield of olefins from the paraffins. This contrasts with a maximum of 15% by thermal cracking of the gases.

The charge stock, consisting for example, of a mixture of the iso- and normal butanes, is passed through a heating coil in a furnace, raised to 1075° F., then passed to one of several reactors which are alternately on stream and regeneration. The catalyst is of the chromium-oxide on alumina type. The gases leave the catalyst tubes at a pressure only slightly above atmospheric and temperature of 1125° F.

The butane-butene mixture and hydrogen from the dehydrogenation system are cooled and compressed to 100-200 psi. and then passed to an absorber where the hydrogen is separated. A stripper is provided for removing the butane-butene mixture from the absorption oil, which is cooled and returned to the absorber. The butane-butene product is then pumped to the polymerization process.

The dehydrogenation reactors are of heat-exchanger type. The catalyst is contained in vertical tubes, heated by hot combustion gases circulated around the tubes within the jacket. The butane passes through the catalyst at a high space velocity, and approximately 25% of the charge is dehydrogenated. The catalyst is not poisoned by sulfur

*Universal Oil Products Co.

†This is a condensation of a paper presented under the title, "The Catalytic Dehydrogenation Process (Gaseous Paraffins to Olefins)" at the 20th Annual Meeting of the American Petroleum Institute in Chicago, Nov. 17.

TABLE 1

	Mainly n-Butane			1:1 n- and Isobutane Mixture			Mainly Isobutane		
Periods on stream, from start	290–1	345–8	366–9	148–50	184–7	214–7	62–65	88–91	109–112
Space velocity, per hour	1,460	1,465	1,450	1,440	1,465	1,395	1,320	1,360	1,385
Av. temp. of catalyst, deg. F.	982	976	987	999	996	996	1,000	1,020	1,021
Inlet pressure, p.s.i.	52	52	52	52	51	52	60	62	69
Outlet pressure, p.s.i	20	18	18	20	20	20	5	5	5
Inlet gas:									
Composition: Mole per cent									
C_3H_8	0.8	....	1.0	2.7	3	3.5	4.6	8.8	9.4
i—C_4H_{10}	13.1	16.8	16.7	58.8	40	42.0	77.1	78.7	79.0
n—C_4H_{10}	86.1	82.3	82.3	37.2	56	54.2	18.3	12.5	11.6
C_5H_{12}	....	0.9	....	1–3	1	0.3	....	....	....
Outlet gas:									
Composition: Mole per cent									
H_2	17.3	18.0	18.1	21.2	18.8	20.2	18.4	21.6	20.1
CH_4	1.4	1.6	1.7	1.9	1.8	3.2	1.8	2.0	1.2
C_2H_4 and C_2H_6	0.5	0.5	0.19	0.2	0.1	0.5	....	....	0.7
C_3H_6	0.4	0.3	0.9	1.0	1.0	0.8	1.2	1.8	1.6
C_3H_8	1.5	1.3	1.5	4.4	5.2	3.4	4.4	7.4	8.1
i—C_4H_8	3.3	2.9	3.2	10.9	7.0	6.9	13.3	12.7	11.6
n—C_4H_8	15.9	15.7	17.0	9.9	12.2	12.1	3.4	5.9	5.5
C_4H_{10}	59.7	59.7	56.7	50.4	53.3	52.7	57.5	48.6	51.2
Conversion:									
Moles C_4H_8 converted per 100 moles C_4H_{10} charged	25.7	24.9	28.1	31.6	29.5	29.0	24.9	30.8	28.1
Conversion corrected to 1050° F. and 2000 space velocity per hour	36	36	37	38	37	36	31*	33*	30*
Efficiency (mole C_4H_8 per 100 mole C_4H_{10} converted)	93	94	91	89	86	88	88	86	86
Yield per pass (mole C_4H_8 per 100 C_4H_{10} charged)	24	23	26	28.2	25.4	25.6	21.8	26.5	24.0
Yield per pass corrected to 1050° F. and 2000 space velocity per hour	33	34	34	34	32	32	27	28	26

* Lower conversions partly due to high propane content of charge.

TABLE 2

Hydrocarbon Gases Produced in the United States in 1939

Cubic Feet:	(Billions of Cubic Feet) Natural Gas 2500 Per Cent	Refinery Gas—Crude Distillation 250 Per Cent	Cracked Gas 350 Per Cent	Total 3100
Methane	69	61	53	
Ethane	14	21	15	
Propane	9	12	5	
Butanes	5	4	2	
Ethene	..	..	6	
Propene	..	..	13	
Butenes	..	..	6	

TABLE 3

Hydrocarbon Gases in 1939

	(Billions of Cubic Feet) Natural Gas	Refinery Gas—Crude Distillation	Cracked Gas	Total Hydrocarbon Gas (Cubic Feet)
Methane	1725	152.5	185.5	2063.0
Ethane	350	52.5	52.5	455.0
Propane	225	30.0	17.5	272.5
Butanes	125	10.0	7.0	142.0
Ethene	...	....	21.0	21.0
Propene	...	...	45.5	45.5
Butenes	...	....	21.0	21.0

compounds nor carbon monoxide but the material of the reactors must be such that iron oxides are not formed.

A feature of the process is that the cycle of reaction and regeneration time is relatively short, approximately an hour. During regeneration hot oxygen-containing gases pass through the catalyst to burn off the deposited carbonaceous materials. Spent reactivating gases and combustion products are recycled for temperature control after temperature adjustment.

Results

Typical results obtained in a semi-commercial plant operation are given in Table 1. Three representative commercial charging stocks consisting of (1) mainly normal butane, (2) mainly isobutane, and (3) a 1:1 n- and isobutane mixture were used.

The periods on stream refer to the beginning of the catalyst's life. The analyses of the inlet and outlet gases are averages over the consecutive processing periods indicated in the first row. Our definitions of conversion and efficiency are given in the table. The yield per pass is defined as the product of conversion times efficiency.

Particular attention is drawn to the efficiency figures which all lie between 85% and 95% of the theoretical. It may be seen also that the volume of hydrogen agrees with the dehydrogenation equation; for it equals, in the first approximation, the sum of the volumes of the butylenes. Catalysts have practically-constant activity and selectivity over the period of approximately 2000 hours.

The economic possibilities of the process are shown by Tables 2 to 7. The approximate volumes of hydrocarbon gases available in the U. S. are given in Tables 2 and 3. The yearly volumes of ethene, propene, and butenes potentially available in the U. S. are shown in Table 4.

The potential polymer gasoline of 81 octane number available from the latter is 8,345,000,000 gallons. The breakup of this volume is shown in Table 5 and is based on only 25% of the ethene polymerizing with the propene and butenes, which is the actual commercial performance when using the catalytic process of polymerization. The volume of 96-octane aviation gasoline potentially available from the butenes is more than 2,180,000,000 gallons per year. The normal butene left over in the residue gas from the first polymerization reaction is subjected to polymerization in a second step which, upon hydrogenation, produces a saturated 85-octane aviation-gasoline stock. The annual volume potentially available of this product is 1,095,000,000 gallons. The potential aviation and polymer gasolines from the volumes of starting gases shown in Table 4 are shown in Table 6.

A number of economic situations exist when it is more

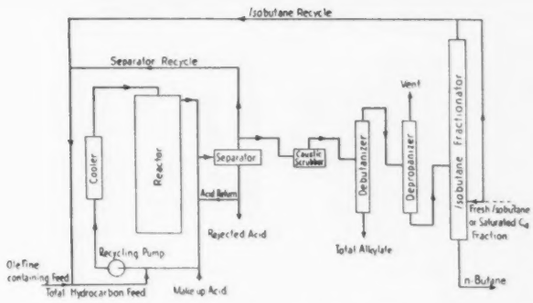


Diagram of Iso-octane process via Dehydrogenation—Polymerization—Hydrogenation

desirable to alkylate isobutane with ethene, propene, and butenes than to use the combination processes of polymerizing and hydrogenation. It is estimated as an average, that normal and isobutane are present in the ratio of 25% to 75%. This means that there is potentially available about 35,500,000,000 cubic feet of isobutane in the gases listed in Table 3.

The thermal alkylation of combining isobutane with ethene at high temperature and pressure, producing neohexane of 95 octane rating, has a yearly potential production of 1,290,000,000 gallons, assuming that all isobutane available is used in this process. The catalytic sulfuric-acid alkylation process may use propene and butenes with isobutane to form alkylate. The volume of alkylate from propene and isobutane potentially available, if all the isobutane were used, would be 1,500,000,000 gallons of 85 octane rating. If butenes are used for alkylation with isobutane, the yearly volume available of alkymer would be 1,715,000,000 gallons of 93 octane rating. A comparison of the yearly potential aviation gasoline available, if each one of the three processes were used alone, is given in Table 7.

TABLE 4

Ethene, Propene, and Butenes Potentially Available by Catalytic Dehydrogenation and Cracked Gases

	(Billions of Cubic Feet Annually)
Ethene	420.5
Propene	290.5
Butenes	148.8

TABLE 5

Potential 81-Octane Polymer Gasoline

From:	Gallons
Ethene	420,000,000
Propene	4,650,000,000
Butenes	3,275,000,000
Total	8,345,000,000

TABLE 6

Potential Aviation and Motor Gasoline

	(Gallons) 80-Octane Polymer Gasoline	85-Octane Aviation Base	96-Octane Aviation Base
Ethene	420,000,000	.....	.....
Propene	4,650,000,000	.....	.....
Butenes	.....	1,095,000,000	2,180,000,000

TABLE 7

Aviation Gasoline Potentially Available from Hydrocarbon Gases

Process	Gallons	Octane No.
Dehydrogenation } Polymerization } Hydrogenation (from butanes-butenes-hydrogen)	2,180,000,000 1,095,000,000 3,275,000,000	96 85 92 average
Thermal Alkylation: Neohexane	1,290,000,000	95
Isobutane and ethylene		
Sulfuric-acid alkylation (isobutane and butenes)	1,715,000,000	93

Refining Becomes Petroleum-ization In Chemical Process Invasion†

By Hugh W. Field*

ABSTRACT

The numerous new processes for manufacture of high-octane gasoline are being applied to petroleum refining at a rate which is confusing to many refiners. To assist the organization and rationalization of the study of the economic applications of these new processes, including dehydrogenation, alkylation, isomerization, etc., it is proposed to discuss their applications in plain language with the aid of a chart.

THE accompanying chart starts with crude oil and presents the various courses which might be taken in converting this crude to gasoline as a major product. The shaded circles are positions where a stop is made to review ways and means, before taking the next step.

Natural gas, butane and lighter (except when pentane isomerization is indicated) can be converted to either high-octane motor gasoline or to aviation gasoline. Because natural gas is, in general, completely saturated, either catalytic or thermal dehydrogenation is necessary. If motor gasoline is the goal, this choice is governed by investment and operating-cost estimates. If aviation gasoline is desired, or if flexibility for future changes to aviation gasoline is desired, or if flexibility for future changes to aviation production is a requirement, the choice probably will be catalytic.

Essentially the same reasoning applies to choice of type of polymerization unit. If aviation gasoline is not desired, the investment comparison must take cognizance of the fact that the dehydrogenation is an integral part of the thermal-polymerization plant.

If a catalytic-polymerization plant is chosen, the decision must be made between selective operation for iso-octene followed by hydrogenation to iso-octane or non-selective operation for a higher yield of high octane (80+) motor fuel. Perhaps a plant built for selective operation, but operated for motor fuel and without hydrogenation, is indicated in order to avoid closing the door to future aviation-gasoline production from this stream.

If iso-octane is produced, a high-octane front-end volatility correction can be prepared by isomerizing some of the normal pentanes in the crude to isopentane. This step is indicated if the loss in octane rating of iso-octane when blended with natural gasoline is sufficient to justify the investment and operation of such a plant.

*The Atlantic Refining Co., Philadelphia.

†This is a condensation of a paper presented under the title, "Petroleum-ization—1940," at the 20th Annual Meeting of the American Petroleum Institute in Chicago, Nov. 17.

H. W. Field, assistant manager of research and development, The Atlantic Refining Co., is a graduate of the University of Pennsylvania in 1928. He joined Atlantic, progressing from junior engineer in the crude evaluation laboratory, through development work of various types, to supervisor of cracking pilot plants, process development supervisor in 1937, and his present position

Straight-run Gasoline

The light fraction of the straight-run gasoline may be subjected to catalytic dehydrogenation (catalytic reforming) to make a high octane (85+) aviation fuel with good lead susceptibility. If the octane-number increase does not justify the sacrifice in yield which accompanies the reforming, catalytic desulfurization alone may be indicated to produce low sulfur stocks for special naphthas or to take advantage of the increase in lead susceptibility which results from sulfur removal alone. As previously mentioned, this latter step must stand the careful economic scrutiny of comparison to chemical treatment. Cyclization and aromatization are yet dependent upon developments making them practical.

The entire straight-run gasoline can be dehydrogenated catalytically or desulfurized, with the choice developed using the same reasoning that was used for the light fraction. The straight-run gasoline available also should be kept in mind when laying plans for processing refinery gas.

The heavy straight-run gasoline, long the standard charge for thermal reforming, can be dehydrogenated catalytically to produce a high yield of high-octane desulfurized blending stock. However, it should be remembered in planning this operation that the change in boiling range is much less with catalytic than with thermal dehydrogenation. If thermal reforming has been used to control overall gasoline volatility for the refinery, care must be taken that the entire plant volatility balance not be upset. If this becomes serious this fraction may be left for thermal reforming. Inasmuch as the desulfurization obtained is less than half that which would have been experienced by using the catalytic unit, catalytic desulfurization of the thermally-reformed naphtha may be justified. As a last possibility, if the sulfur situation is not serious and the catalytic desulfurization cannot be justified, the good old standbys, vapor-phase clay treatment or chemical treatment, may be used.

Refinery Gas

Most refinery operations produce some gas in addition to liquid products. This gas can be a very profitable source of either aviation gasoline or motor fuel. The various steps that can be taken to realize profits from this situation are quite varied, particularly as much depends on the type of gas available which, in turn, is a function of crude run and previous processing methods. The best that can be done here is to discuss the possibilities and indicate the type of thinking necessary to evaluate a given situation.

If a catalytic-alkylation plant is being considered for

Patton to Manage Alco Products Sales

C. S. Patton, newly appointed sales manager, Alco Products Division, American Locomotive Co., is in charge of sales of heat exchangers, condensers, feed water heaters, evaporators, tubular equipment, pressure vessels, fabricated plate work, and other lines.

A graduate mechanical engineer from Cornell, Mr. Patton spent eight years with the shipbuilding industry in various capacities with Manitowoc Ship Building Co., the U. S. Shipping Board, and Staten Island Ship Building Co. In 1926 he became New York manager for Biggs Boiler Works Co., Akron, Ohio, and in 1929 he took charge of sales of fabricated plate work with Heat Transfer Products Co. which was acquired by American Locomotive Co. and expanded into Alco Products Inc.

production of aviation gasoline (96+ octane), three possible channels must be considered. These three considerations are necessitated by the requirement that the feed to the alkylate plant must contain isobutane and butenes in molecular ratio of slightly more than 1 to 1. Most refinery gases contain one-third to one-half the quantity of isobutane necessary to supply this requirement; and, if no steps are taken to correct the situation, the alkylate produced will be too low in octane rating.

The first possibility is fractionation of natural gas for its isobutane content and addition of this to the refinery gas in proper amounts to meet the requirements. This necessitates having available and handling large quantities of natural gas.

The second possibility is isomerization of butane to isobutane to a sufficient degree to build up the isobutane-butene ratio. In refineries having highly-unsaturated gas it may be necessary, in addition to this, to isomerize some of the butane from natural gas to augment the isobutane available.

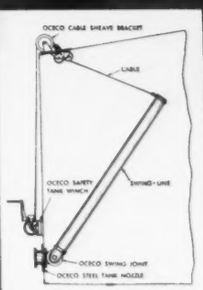
The third possibility lies in the other direction, i.e., reduction of the content of butenes, by catalytically polymerizing some of these butenes. The butanes pass through this process unchanged; and although in a given refinery this method produces considerably less alkylate, it does produce, more or less as a by-product, high-octane polymer gasoline for use as a motor-fuel blending stock.

Both catalytic- and thermal-alkylation processes are shown on the chart. As previously mentioned, the eight-carbon-atom alkylate is made in a catalytic process now commercially available. The thermal-alkylation process previously mentioned which produces neohexane, a six-carbon-atom alkylate, is not as completely developed at present, but is sufficiently close in accomplishment to be considered competitive for this survey—particularly as the thermal alkylate is a superior product in anti-knock value (120+ vs. 96+).

If motor fuel is the goal in processing the refinery gas, polymerization should be considered; inasmuch as, at the present time, an alkylation plant is difficult, if not impossible, to justify economically for motor-fuel production.

Thermal-polymerization units have a high investment cost, but do produce high yields of high-octane (76+) gasoline. This high yield is due to the inherent dehydrogenation which takes place in the plant heating coils, plus a certain amount of alkylation which occurs between the

OCECO Swing Lines
MEET THE REQUIREMENTS OF PRACTICAL OPERATION



Specify OCECO FITTINGS your tanks deserve the best

• Oceco swing line equipment consists of a steel nozzle, a heavy duty swing joint that will not twist or leak, a gas-tight stuffing box and cable sheave mounted on the tank top, and winch—all of Oceco's serviceable design and dependable manufacture. Winches are worm geared and self-locking. Oceco swing lines meet any tank requirement. Write for descriptive literature.

OCECO Fittings
THE JOHNSTON & JENNINGS CO.
OCECO DIVISION
885 Addison Road • Cleveland, Ohio
Engineering and Sales Services: NEW YORK • CHICAGO • PITTSBURGH
BEAUMONT, TEXAS • TULSA, OKLAHOMA • LOS ANGELES • OAKLAND, CALIF.

INDEX TO ADVERTISERS
Refining Technology Section

(*See also page 43*)

This index is published as a convenience to the reader. Every care is taken to make it accurate, but National Petroleum News assumes no responsibility for errors or omissions

Alco Products Div. of American Locomotive Co.
American Meter Co. .....
Badger & Sons Co., E. B. .....
Chicago Bridge & Iron Co. R-507
Crane Co. .....
du Pont de Nemours & Co., E. I. .....
Gasoline Products Corp. .....
Gray Processes Corp. .....
Hanlon Buchanan, Inc. .....
Johnston & Jennings Co. R-523
Kellogg Co., M. W. R-504
Lummus Co. R-511
Merco Nordstrom Valve Co. .....
Perco, Inc. .....
Petroleum Rectifying Co. of Calif. .....
Sun Shipbuilding & Dry Dock Co. R-515
Taylor Instruments Companies .....
Universal Oil Products Co. 25

saturates and unsaturates. In addition to the octane credit, the thermal polymer should be given a high volatility credit. Thermal polymer gasoline is extremely rich in front-end volatility; and, properly evaluated, this credit may amount to more than the octane credit.

Catalytic polymerization, if operated selectively and in conjunction with a hydrogenation unit, is directly competitive with the alkylation process in producing iso-octane. In this comparison of processes, the possible necessity for isomerization of butane for the alkylation plant must be considered and compared with the probable necessity for isomerization of pentane as a blending stock for the hydrocodimer. Alkylate has inherently better front-end volatility characteristics than hydrocodimer, which may give the alkylation process an economic advantage in certain circumstances.

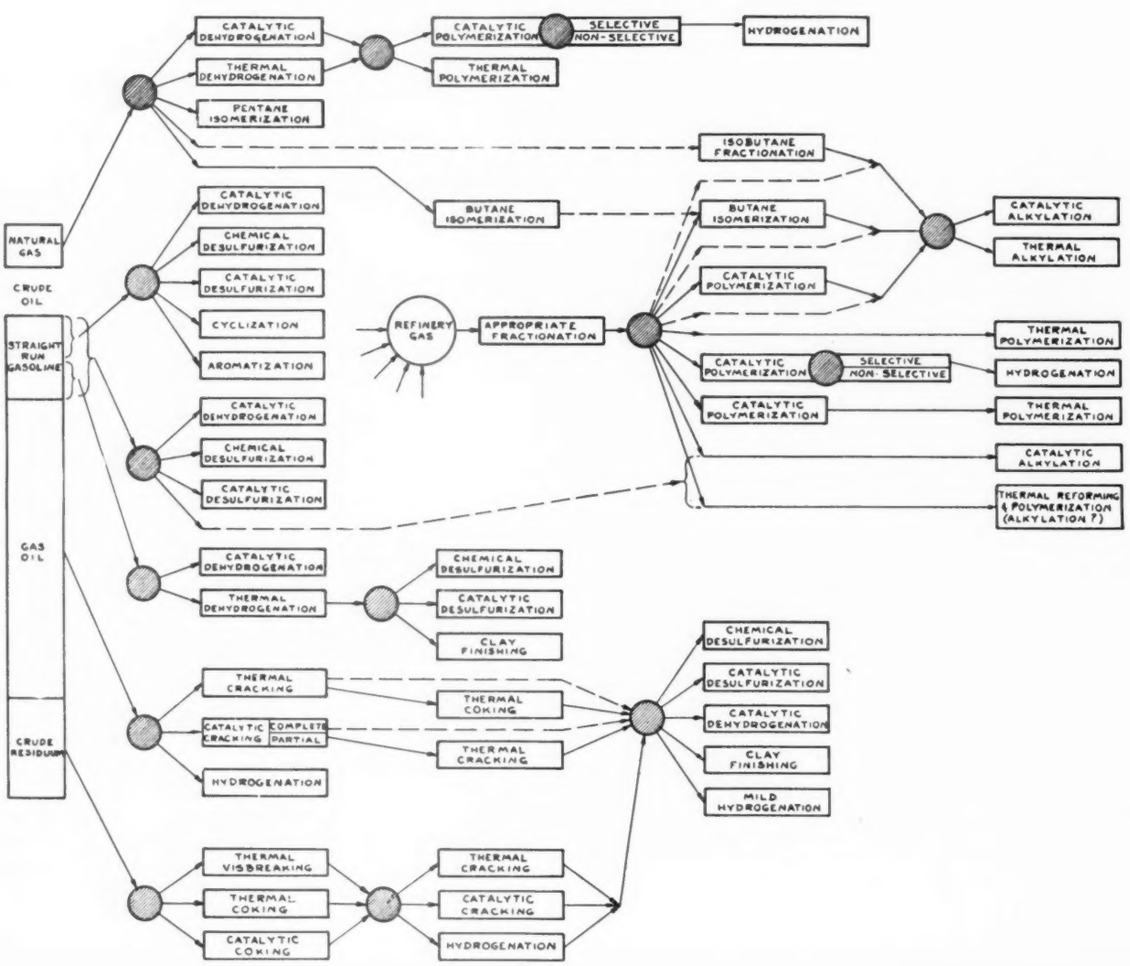
If a non-selective catalytic-polymerization plant is being considered, the competition is with the thermal unit—both being considered for motor-fuel production. Inasmuch as the catalytic unit reacts only the unsaturates, the ultimate gasoline yield from a given gas stream is considerably lower. However, the investment and operating costs are substantially lower, and units much smaller in capacity than would be practicable for a thermal unit can be considered. The catalytic-polymerization unit is definitely a "cream skimmer," with a quick payoff and, as such, should be examined carefully, particularly for a small refinery.

In a large refinery the application for catalytic polymerization well may be in conjunction with a thermal unit, utilizing the "skimming" effect cheaply to polymerize the unsaturates—the thermal unit following to complete the cleanup. Further, excess or standby capacity for peak or abnormal loads can be installed and operated cheaper catalytically than thermally. For the large refinery this combination of catalytic and thermal polymerization is probably the most flexible setup that can be obtained commercially at the present time. This is particularly true if the catalytic plant is designed for either selective or non-selective operation.

The possibility of catalytic dehydrogenation prior to catalytic polymerization has not been discussed in connection with refinery gas, but was mentioned for natural gas. Processing natural gas, particularly for aviation gasoline, seems to be the most promising place for application of this combination at the present time, due to the relatively high investment costs for butane-dehydrogenation equipment. If this situation changes in the future, and it is believed that it will, consideration should be given to refinery-gas applications for catalytic dehydrogenation.

The last two processes indicated handling refinery gas, and involve simultaneous processing of the straight-run gasoline from the crude. Thermal reforming and concurrent gas polymerization was developed initially in an effort to give the small refinery a chance to obtain the advantages of thermal polymerization by combining the operation with thermal reforming, in the same coil. Developments have shown that more than concurrent reforming and polymerization take place. Possibly both alkylation and isomerization play a role in the surprisingly satisfactory results obtained. The possibilities of such combined processing should not be neglected in studying a large refinery, particularly as rumor has it that a catalytic-alkylation process is in the offing which produces excellent results from such a combined charge.

PETROLEUM-IZATION - 1940



For Even BIGGER Winter Change-Over Markets

There is already no doubt that the oil companies' sales this fall of winter conditioning and lubrication jobs for the nation's automobiles have been the LARGEST ON RECORD—perhaps in excess of the $210,000,000 market that was estimated by NATIONAL PETROLEUM NEWS when this present campaign started.

Just how much BIGGER this year's Winter Change-Over business has been than last year, NPN wants to learn from oil marketers and managers of oil marketing companies, from their success in their own sales drives.

For the extent of sales increases in the Change-Over business this fall and winter will prove the success of the promotion efforts the oil companies put behind this present campaign, and will make it easier for the whole marketing industry to get behind the two seasonal Change-Over drives a year, in the future. Already, one alert sales manager is asking NPN for its ideas on the possibilities for the coming Spring Change-Over business.

NATIONAL PETROLEUM NEWS, in connection with its promotion of this fall's BIGGEST Change-Over campaign, in its last seven issues, has promised to list oil marketers and company managers who showed increases in their Change-Over business this fall, on an NPN Roll of Honor. To help in compiling this Roll of Honor, and to show the results of this year's Winter Change-Over campaign, NPN now asks oil marketers and managers of marketing companies to send to its Editorial Department, as soon as possible, their percentage sales increases this November, from last November, in—

1—Lubricating oils and greases.

2—Chassis lubrication jobs.

3—Tires, batteries and other accessories and services, if these figures are available. Ratings for the NPN Roll of Honor, however, will be on the basis of percentage sales increases of lubricants and lubrication services, which are the necessities for Winter Conditioning. Gasoline sales need not be included.

Marketers who show a 25 per cent increase in Change-Over sales this November, from November last year, will be listed on the NPN Roll of Honor as SILVER STAR MARKETERS.

Marketers showing a 50 per cent gain in Change-Over sales this November will be GOLD STAR MARKETERS.

Marketers showing a 100 per cent gain will appear on the Roll of Honor as DIAMOND STAR MARKETERS.

These reports from oil marketers should be sent to NPN on their company letter heads. They will be published, as they are sent in, together with any other facts or experience these marketers can give as to their success in this fall's Change-Over sales.

The marketers who send in their percentage sales increases will be given a Certificate of Honor by NATIONAL PETROLEUM NEWS, as evidence of their ability in selling Winter Change-Overs.

The two seasonal Change-Over campaigns are the best PROFIT OPPORTUNITIES of the year for oil marketers. The business they develop comes from SELLING and is not chiseled on price from some other company. The more oil men and the more companies that promote and sell Change-Over servicing, both spring and fall, the more will be impressed on the public's consciousness that its cars need seasonal protection and the LARGER THE CHANGE-OVER SALES WILL GROW.

The oil industry this fall developed by far its best campaign yet for Winter Change-Over sales. More money was spent in advertising and merchandising. More companies held sales promotion meetings. NATIONAL PETROLEUM NEWS, starting with its Oct. 11th issue, devoted space in every issue, to tell how to plan for the Winter Change-Over campaign, how to train station salesmen for it, how to stock stations, among other points. The heads of several of the state marketers' associations, through its pages, urged independent marketers to make the most of the opportunities in the campaign to build up their own sales.

Now the record of what this increased promotion and sales effort has done for oil marketing companies' business should be told as promptly and fully as possible. For the planning necessary for the coming Spring Change-Over campaign is not many weeks ahead. The experience in actively and soundly promoting this fall's campaign will help oil companies' sales next spring, and again next fall.

So NATIONAL PETROLEUM NEWS asks marketers and managers of oil marketing companies everywhere to send in their sales increases for their November Change-Over business, as soon as possible, in order that ALL in oil marketing may have this experience to aid in their planning for EVEN MORE PROFITABLE Change-Over business in the future.

Make Stations Christmas "Gift Headquarters"

Oil company stations as CHRISTMAS GIFT HEADQUARTERS.

Not a crazy idea at all, many stations over the country have already learned through their experience in past years.

Even the automotive necessities, such as tires, batteries, and spark plugs, are most acceptable gifts to a car owner who has to watch his pennies and would otherwise delay these purchases. And for any car owner, what sort of present would bring more pleasure than a car radio, or more comfort than a heater or a windshield defrosting device.

More oil company stations each year are DRESSING UP for the Holiday season, thus co-operating in the spirit of the season with their neighborhood or community. Decorating the station puts it in the class with all the other stores that appeal to the Christmas shopper, and these stations have found their business has been helped, even if it is only through the car owner being a little more generous with himself in his buying for his car's needs.

Going a step farther and impressing on station customers that the station carries merchandise that is acceptable as Christmas gifts and that it can be bought in comfort at the station, in contrast with the crowds of shoppers in the stores, has materially helped the business of some companies. If stations generally would decorate for the Holidays there would be a noticeable increase in their sales of certain types of merchandise, one oil company executive told NPN.

MERCHANDISE WILL NOT SELL ITSELF

Christmas merchandise at stations will not sell itself, but a marketing plan must be worked out as with any sales campaign, oil marketing company managers who have had experience along this line told NATIONAL PETROLEUM NEWS. The major points that were suggested for a marketing program for Holiday selling included:

Decorating the station and dressing up the merchandise, in keeping with the Christmas atmosphere.

Good displays of the merchandise itself, keeping them clean and attractive and changing them, to keep up the interest of both the station men and their customers.

Advertising the station as Holiday Gift headquarters, so that customers who come in will know Holiday goods are on sale there.

Building a good sales story of why the service station where the motorist trades regularly is the best place to buy Christmas gifts for the car owner. That sales story can bring out the convenience of shopping without leaving the car, contrasting it with the crowded stores. It can show how the purchaser who is a regular customer can use the station's plan in financing a purchase such as a tire, car radio or heater.

Decorating the station for the Holidays is good business, whether or not gift merchandise is featured. If a station is competing for the Christmas shopper's money, decorations are a "must".

TALKS NEW USES FOR MERCHANDISE

A survey of the present merchandise stock at service stations will often suggest some items that can be sold as gifts, without the station stocking up on special Holiday merchandise, another oil company sales executive told NATIONAL PETROLEUM NEWS.

Car heaters and better bodies have greatly reduced the market for automobile robes as such, this executive stated. However, displayed and talked up as "utility robes," for comfort in watching winter sports, for bob sled rides, skating parties and for invalids and elderly people at home, these items still sell, he said.

Seat covers are ordinarily thought of as summer items to sell to protect the upholstery from the dust and dirt of summer driving. They are acceptable to new car owners at any season, he stated, to save the upholstery from becoming soiled.

There is a market even now, he stated, for sun glasses if they are displayed and sold as "driving glasses," to protect driver's eyes from the glare off the snow.

HAPPY NEW MILEAGE IS TIRE SLOGAN

Some of the tire companies supply advertising copy which oil marketing companies can use over their own name, to show the advantages of tires as Christmas presents. They also furnish posterettes and window banners which the oil companies can supply their stations, featuring tires as gifts.

"Merry Christmas and Happy New Mileage" is the slogan of one tire company in the advertising copy it suggests for oil company stations to use.

Tires make grand gifts, the copy brings out; they give safety and pleasure throughout the year and offer one-third more mileage when bought at this time of the year. Engineers have proved, this company says, that tread wear is one-third less in cold weather than when the pavements are scorched by the summer sun.

Another tire company suggests that service stations put a sign appropriate to the season in their display window and suggests that the tire be bought now and laid away for a gift. It offers displays for A-boards and windows with such signs as, "Merry Christmas and Safe Traction for the New Year," and "Merry Christmas and Many Years of Safe Driving." This company also suggests that oil company service trucks carry a Holiday greeting sign on the right side so that motorists passing it will receive a cheery Christmas greeting.

STORES DON'T PUSH ACCESSORIES

The sales manager for one oil marketing company believes that service stations could benefit, in their sale of automotive goods as Christmas gifts, from the fact that sales of this line of goods in department stores are slack at this time of the year.

People who go downtown

Service stations lend themselves to more effective Holiday decorations than most stores. This is a station of the Goodyear-Wende Oil Co., independent oil marketing company in Buffalo. The company spends about $2500 each year to decorate 35 stations and believes it is a good investment

"Christmas shopping" don't usually wind up in the accessory department of a store and make their purchases there, this sales manager believes and he says the sales records of department stores in December bear out his conclusions. Merchandise in other departments of stores pulls better as gifts than accessories, he says.

However, he states, many auto accessories do make very acceptable Christmas gifts to men particularly and they can be sold to better advantage, he believes, to shoppers who are away from the distracting influence of other kinds of merchandise which have more "gift appeal" at the moment.

CATCH THE SPIRIT OF THE SEASON

"The effect of decorating service stations for the Christmas season is extremely beneficial on the regular trade, because people feel you are cooperating with other merchants in encouraging Christmas buying and are also sponsoring the Christmas Spirit that is so beneficial to the goodwill of every community."

This is the comment to NPN of F. H. Richard, vice president of the Goodyear-Wende Oil Corp., independent marketer of Buffalo, which goes to considerable effort to decorate its stations for Christmas. An accompanying photograph shows one of its stations dressed up for the 1938 Christmas trade.

This company makes a special effort to sell merchandise as Christmas gifts, states Mr. Richard, who comments further that, if stations generally would decorate for the Holidays there would be a noticeable increase in their sales of certain types of merchandise.

Mr. Richard said the cost to his company of decorating its 35 stations during the last Holiday season was about $2500.

The company decorates about ten days before Christmas, believing this far in advance is necessary to let the station benefit from Christmas buying. It features Holiday decorations in its merchandise displays, on the pump islands, in the station windows, and on the display shelves, changing the displays immediately after Christmas.

It brings to its customers that its stations are Holiday gift headquarters through advertising of various sorts—newspapers, letters, etc.

"It is quite surprising the number of customers who do comment on the fact that our stations are decorated and it is equally surprising to see the number who appreciate our efforts towards adding to the Holiday atmosphere," said Mr. Richard.

COST $30 TO DRESS UP HIS STATION

Fred E. Mitchell, who operates a station in Toledo, O., said he puts his decorations up four or five days before Christmas because he likes to have them looking fresh between Christmas and New Years.

He says the fact the station is dressed up helps the salesmen to make special efforts to sell tires, defrosting fans, winter fronts and other accessories as Christmas presents. "Our decorations increased our business and we received much comment from customers," said Mr. Mitchell. His station won first prize last year, in the service station class, in a contest sponsored by a Toledo newspaper for best decorated business houses and homes.

"We had two Christmas trees decorated inside our station windows, one featuring car accessories and the other items the station carries which supply household needs," he said. This included handy cans of lubricating oil, lighter fluid, polishes, etc.

Mr. Mitchell and the station salesmen plan several weeks in advance how they want to decorate the station. They put all their ideas together, pick out the best, and then put their plan on paper before starting to work it out. The cost of decorating his station the first year was only $30, he stated, and this has been reduced since, as many of the lights and decorations can be used over again.

LIST GIFT ITEMS IN ADVERTISING

Oil marketing companies have found newspaper advertising an effective means to bring to the attention of the community that their stations have Christmas gifts for sale. The companies which have had experience advise that the advertising copy first bring

out that the stations are Headquarters for Christmas Gifts for Car Owners and, second, list a number of items of merchandise that have appeal as gifts and give the prices at which they can be bought and any special inducement the oil company can offer for their purchase at its stations. These inducements might include instalment financing, the fact that installation of the gift item will be made for the car owner, among other points.

This advertising can be continued, in its useful life, beyond the date of its appearance in the local paper, by cutting out the ads and posting them on bulletin boards prominently at all stations. The ads can be called to the attention of the customer who comes in for gasoline or some regular service and he can be asked if he would not like to look over the list and see if some of the items will not very acceptably fit the needs of his Christmas shopping list.

Where the station feels its territory is too restricted to benefit fully from newspaper copy, hand bills can be distributed from the station and also through the neighborhood. The copy should be of the same nature as in the newspaper ad, it is suggested.

An even less expensive method of calling the trade's attention to the station as Gift Headquarters is through small cards, to be passed out at the station, which list the merchandise items that can be bought there.

SELLS NEEDS FOR HOLIDAY TRIP

"Are you going away for the Holidays?" is the question one oil marketer has his station salesmen ask as a lead for a sales talk on a gift purchase at the station.

If the answer is, "Yes", or the customer shows interest in the approaching Holidays, this marketer has his men suggest the car be looked over for the sale of some item or service that will make the trip pleasant and comfortable, even to a new headlight bulb or a grease job.

While the conversation is on this subject, he states, it is easy for the station man to mention extras and accessories the station sells that "make dandy Christmas gifts," such as spot lights, seat covers, grille guards, rear view mirrors, among others.

Attractive store and window displays are important, it is pointed out, and many items are sold because a prospect has been attracted by an interesting arrangement of merchandise.

"Decorate your station," urges this marketer. "Put in catchy, attractive displays and START TO PUSH every item in the station and you will be surprised how your station business will respond to the buying mood of Holiday shoppers."

OFFERS BONUS TO SALESMEN

Management of the salesmanship within the station was cited by some marketers to NPN as the most vital factor in the success of selling automotive merchandise at stations as Christmas gifts. These men pointed out that the station men need first to be sold themselves on the fact that certain accessories, and even the petroleum products themselves, are acceptable as gifts to a great many car owners. Then the station men should be given some personal inducement to work hard on selling to Christmas shoppers, it was brought out.

On the type of merchandise that figures in this special Christmas selling some oil marketing companies provide for a 10 per cent commission to the men on their sales. If this is a higher commission than the company pays over the year on sales of automotive equipment, it can be explained that this is a special campaign, which will be new to most station customers, hence the extra inducement to the salesmen to drive hard to make it a success. Christmas gift sales mean extra profits for the station, to be shared with the salesmen.

Another point made on commissions to salesmen on campaigns during the Holiday season is that arrangements be made to pay the men their commissions before Christmas, in order that they may feel that they are earning something extra towards their own Christmas spending.

CAR HEATER "IDEAL" GIFT

A car heater will be featured as a most acceptable gift "for your family or a friend—or for your own personal comfort," by one leading manufacturer of car radios and heaters. The heater will be played up more prominently than the radio line, in advertising this company will do in national consumer magazines the middle of December, to bring the idea of something new for the automobile as a Christmas gift to many millions of motorists over the country.

This company recently completed a survey and found that only 40.7 per cent of new cars sold were delivered with a heater installed. On the other hand, it found that approximately 45 per cent of new cars were equipped within a year, with a heater of some other make than that supplied by the car dealer, thus showing the opportunities for the service station to sell its own line of heaters.

"At this time of the year the customer buying a car is an immediate prospect for a car heater," stated this company, "hence it is important that the independent dealer contact the customer immediately after learning of his purchase of a new car, or preferably even before the purchase is made, so that he can close the sale of the heater."

SPARK PLUGS AS XMAS GIFTS

A spark plug manufacturer this year is dressing up its product for Christmas selling at stations. It is putting out a special assortment, a total of 30 plugs in four boxes, each box in a bright Holiday wrapper. To help their sale, the oil marketing companies are offered window streamers and display cards for their stations, and cards to insert in the gift packages, giving the name of the station where the plugs will be installed without cost. The assortment of four sets will enable the servicing of practically all passenger cars.

This manufacturer early in December will feature the spark plug gift idea in national consumer magazines to help boost their sale as Holiday Gifts at service stations.

What To Sell Christmas Shoppers

Here is a list of standard merchandise which many service stations carry which the merchandise managers of several oil companies helped NATIONAL PETROLEUM NEWS compile as a guide to what can be sold at stations as Holiday Gifts. It is not offered as a complete list, merely suggestions.

Oil Products

Gasoline coupon books.
Car lubrication and motor oil, through special Christmas cards entitling the receiver to a given number of grease jobs and oil changes.
Assorted household lubricants, in a special Christmas package.

Accessory Merchandise

Batteries
Chains
Compasses
Defroster fans
Flashlights
Frost shields
Driving glasses
Grille guards
Heaters
Horns
Jacks
Lights, fog, driving
Mirrors, rear vision
Radiator ornaments
Radios, car
Robes
Seat covers, cushions
Spark plugs
Steering wheel covers
Steering wheel knobs
Tires

General Merchandise

Bicycles
Christmas trees
Golf balls
Fishing tackle

Actions tell a story

Actions speak louder than words and so we just point to these facts:

Three veteran Dubbs refiners right now are enlarging their Dubbscracking capacity

One is increasing it from 3200 to 4200 barrels a day

A second from 4000 to 5000 barrels a day

A third from 1200 to 2000 barrels a day

A fourth is converting his 2000-barrel cracking unit to licensed Dubbs operation

And still others are putting in Dubbscracking for the first time—and U. O. P. poly units, too

There's no need for more words—is there?

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

Service Station School

Run By Indiana Independent Marketer Produces Better Salesmanship Than Where Men Are Trained while Working at the Stations

INDIANA is noted for its numerous schools and colleges, but it has one school that is unique and little is known of it by the public—a school for service station salesmen.

This school is located at Indianapolis and trains station men for Gaseteria, Inc., independent oil marketing company, and for other independent oil companies which operate under the Bonded System, which Gaseteria licenses.

The school is a company service station. It was selected because its layout and equipment and the neighborhood around it provide good facilities for training men how to be successful station salesmen and managers. This particular station was selected also because the man in charge had the necessary qualities to enable him to teach other men, which characteristics are not found in all men by any manner of means.

The men who study at this station school are first carefully selected. Then they not only have practical training there, but they also study at home at night, from textbooks. They take examinations and are graded, just like students in other schools throughout the state. One hundred graduated the past year while another hundred dropped out.

The school was started last fall (1938) by Russel S. and Phil T. Williams, brothers and partners in Gaseteria Inc., to overcome their failure to secure the type of men they desired to represent their company at its stations. They had found they could not hire competent, trained salesmen at the starting scale for service station pay. Their station men were not doing a thorough job of selling and they did not have enough good men to put in charge of new stations as they were opened by the company. The only alternative was to train the men themselves.

Previously, the training of new salesmen had been left with the individual station managers, who as a group were found to be poor teachers. The company had prepared complete manuals, which contained the story of the company's products and its sales program, outlined the duties of the station man in the care and upkeep of the station and told, in simple style, selling and servicing methods at stations. The Williams brothers found that a new man would be given some practical training at the station and then told to take the manuals home to study. That was as near the training of salesmen as was achieved.

So the old method of making the station manager responsible for the sales training of the new men put in his charge was discarded and the present school was established to secure these results:

To show salesmen that the company has a definite merchandising system.

To teach that system to salesmen, and show them how to apply it.

To enable other marketers taking on the Bonded System to teach the merchandising system in their own service stations. These marketers send their station managers to Indianapolis to take the training course so on their return, they can teach the men in their own stations.

The training station at Indianapolis gives a 10-day course and its students are paid for the time spent in taking the course. The work for its "students" includes 10 hours daily in the

The Gaseteria service station in Indianapolis where station salesmen are trained through a 10-day intensive course in salesmanship and outside solicitations. Spacious drives and plenty of customers give students ample opportunity to apply the knowledge gained from studying the Bonded System manuals

station and assignments in home study from the manuals, with written examinations to be turned in the following day. During the day the manager in charge of the training school explains the manuals to the men, giving them oral examinations and personally guides their practical application of sales and service knowledge. The highlights of the 10-day course are personal and station cleanliness; showmanship in performing service; how to analyze customers, teaching how to sell and how to make door-to-door solicitations.

The selection of the service station to be the training school was based on the ability of the manager to teach, rather than on the type or location of the station. A manager was looked for who was tactful, able to handle men, could teach, analyze men, and could instill enthusiasm and loyalty.

The manager selected was in charge of a station just east of the business district in Indianapolis. It covers half an acre of ground space, mainly in concrete drives and gasoline pump islands. The size of the station provided space for teaching cleanliness (Gaseteria stations are everlastingly being policed and polished, inside and out) and the volume of business was sufficient to absorb the extra help.

The station is flanked by two main traffic arteries, so there is plenty of natural marketing territory for teaching outside solicitations. These are taken up on the final three days of the course. Gaseteria continues to operate the station with a regular sales crew, and the training school is run in conjunction with the usual course of business. There is no set time for beginning the course and students are continually arriving and leaving. The maximum number that can be handled is 15 at one time.

About 60 per cent of the men who completed the course in the first year of the training school were Bonded System marketers' salesmen, who teach the system in their own organizations. As time has permitted, some of the older men in the Gaseteria organization have taken the course, and all new men in the Gaseteria stations are sent through the training school.

Since the training school was started about a year ago more than 100 men have completed the course. More than an equal number started the course but dropped out feeling they were not fitted for station salesmanship. The training school has never "flunked" a man, all have left of their own choice, and all have remained friends and customers of the company.

The company's aim is to build a reserve list of new salesmen in its organization. When there is a vacancy a man is employed off the reserve list. Then a new man is sent through the training course, and put on the reserve list for future employment.

The school is conducted by Fred Winkler, who was manager of the station before the training school was installed, and who continues to direct the regular station sales staff as well as train new men. As part of his task he keeps a sharp eye on all the details of housekeeping about the stations. For example, his first move in showing a NATIONAL PETROLEUM NEWS representative his station, was to start in the yard back of the building, rather than out in front where the concrete was spotless, the pumps and globes clean, and the floodlight reflectors glistened.

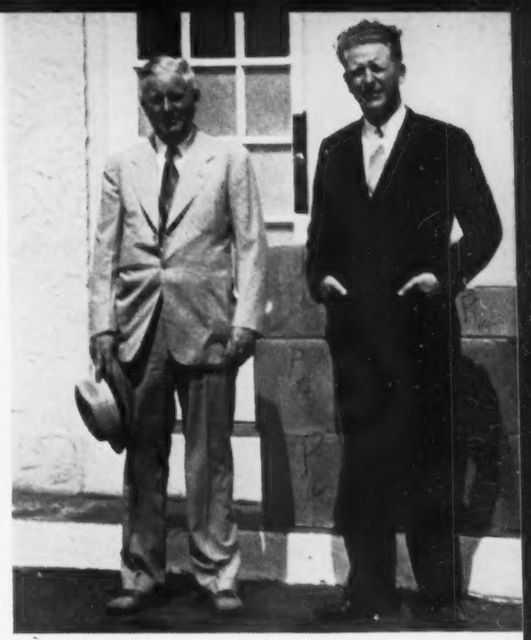
The back yard showed an equally high degree of good housekeeping. Oil drums were neatly laid on side, on wooden skids. Ladders were hung in place. Mr. Winkler explained that

A student at the Gaseteria station school rehearses himself in his sales talk, which must be given exactly as stated in the sales manual

products stored outdoors entered the yard through one gate, were shoved forward and removed through the gate on the opposite side of the station building, so the stock would always be fresh.

The training school is operated continuously, rather than taking a class and completing the 10-day course before accepting another group. It has students in all stages of training, from those just starting to those about to complete the work.

Mr. Winkler opens the first day's training by reviewing the beginner's application record, and putting him through practical tests to indicate his capabilities as a station salesman. Here also the set of his mouth is noticed and the tone of his voice, for indications of whether the man may feel superior or inferior to the job. Mr. Winkler also notes if there are any speech defects that need correction, and whether his speech is clear and distinct. The man is asked to run to a far pump, touch it and return, to indicate whether he is



The Williams brothers, Phil. T. and Russel S., partners in Gaseteria, Inc., of Indianapolis, who found it was necessary to operate their own training school to secure the quality of salesmanship they wanted at their service stations

energetic or lazy. The man is asked to read a few paragraphs from a sales manual, to see if he can put "oomph" in a sales talk.

The balance of the first day is spent in policing up the station building and grounds, to impress the man with the value of personal and station cleanliness.

The general work outline and daily routine for the next nine days of the training schedule are:

Second day; service, with emphasis on mechanical vs. intelligent services and putting showmanship into service so the customer will know that it was performed.

Third day; marketing and how to sell, to bring out that the station man is a salesman and not an order taker.

Fourth day; this covers the chapter in the company's sales manual on "How Bonded Analyzes Its Customers."

Fifth day; salesmanship and the manual chapter on "Bonded Salesmen Sell."

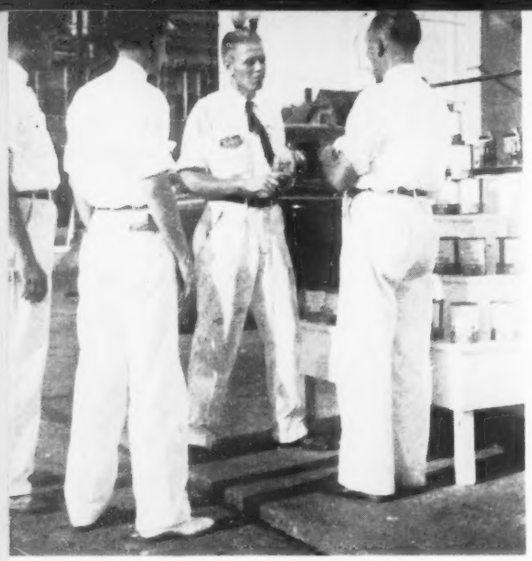
Sixth day; service and the manual chapter on "Bonded Service Is Right."

Seventh day; the company's "Rules and Regulations" manual, taking up all the details of company policy on how to conduct a service station business.

Eighth, ninth and tenth days; outside solicitation.

When the course is finished, on the tenth day, there is a complete examination of the entire course. A grade of 85 or better is required before the student can satisfactorily complete the course.

The men taking the course do not wait on customers until the fifth day, after they have studied service, selling, and the analysis of the customer. The Gaseteria system for waiting on a cus-



Fred Winkler, manager of the Gaseteria training school, right, halts three of his students for an oral examination on the sales manual

tomer is such that the men get plenty of practical experience in selling. If manpower is available three men wait on each customer. The first man reaching the customer—and he goes on the run, solicits the gasoline order. The second man goes to the gasoline tank, removes the cap, takes down the pump hose, ready to put in the quantity ordered when directed by the first salesman. The third begins the service work. As the first and the second salesman complete their assignments they too work on servicing the automobile.

The outside solicitation work, covered during the final three days of the course, combines training in the station and practical "doorbell ringing." Before going out the men have learned and recited many times their sales story on inviting a motorist to come to the station for a dividend sharing book, for a can of household oil, or to patronize the station. After each call the men return to the station to discuss the presentation and the results, and for pointers on how to improve their calls.

Mr. Winkler does not have any set routine for examining the men or talking to them about the course but works individually with them. While discussing the training course with the NATIONAL PETROLEUM NEWS representative he broke off the conversation and asked one of the men to stop his work and recite the explanation of what is the "Bonded System." At the moment there were no customers in the station and all the men happened to be in the building wiping off the merchandise, washing windows or sweeping the floor. The student dropped his work, looked the NPN man right in the eye just as if he was the best customer the station had, and unhesitatingly gave the explanation with all the other men watching.

Mr. Winkler will interrupt the work at any time, when there are no customers about and give an oral examination either in front of the other students or along with the individual student. He asked the NPN representative to go into the station store room, shut the door, pretend he was in his home and observe a solicitation. In a moment the salesman knocked on the door, and gave his presentation. Mr. Winkler then turned the illustration into a practical lesson, by pointing out how the presentation could have been improved.

Men applying for positions in the Gaseteria organization first see Phil T. Williams, one of the partners, at the company's main office, and must meet the following general specifications:

Be married, and over 24 years old.

Have a high school education.

Be at least five feet, six inches tall.

Have nice appearance, and "fire in their eyes."

Previous petroleum sales experience is not essential, but men are preferred who have had chain store selling experience.

The general specifications plus the applicant's background are covered in the interview with Mr. Williams. If the man is acceptable, based on information that can be developed during an interview, he reports to the training school.

Sales, Operating Manuals Are the School Textbooks

The textbooks used in the Gaseteria service station school are the company's sales manual and its manual of rules and regulations for station operators. These were prepared by the company itself to meet its particular sales and operating needs.

The sales manual was revised two years ago from an earlier edition which contained mostly illustrations of the right and wrong ways of servicing and selling at stations. This method of teaching by right and wrong illustrations has been retained. The manual also now consists of eight sections which carry the student salesman from an explanation of the Bonded System and its products into an analysis of the customer and his needs, then into sales methods, then station good housekeeping and finally into the Bonded advertising program.

The manual is well illustrated with drawings. Headlines are terse, explanations brief, and translated in terms of station salesmanship. The chapter on the analysis of customers, for example, has a cover with a station salesman peeking down a microscope at a customer. The text reads, "What sort of person is the average motorist?" The answers are given in seven pages, one to a page.

The first answer is; "Above all he is interested in himself." The illustration shows a man peering into a mirror. The text notes; "A man's name is the sweetest music to his ears . . . . He thinks he is intelligent, personable, influential and even handsome. He need not be an egotist to believe all this. He is born with a high opinion of himself." The caption following asks in capital letters; "What does this mean to you as a salesman?" The text continues, pointing out the importance of remembering customers' names, of treating the customer with respect, to indulge not in flattery nor to bow and scrape.

In the chapter on service the methods are taught with "right and wrong" illustrations. One shows a salesman putting the motor oil bottle on the automobile running board and is labeled "wrong." Beneath, labeled "right," is the salesman placing the bottle on the ground.

Another manual on rules and regulations for station employes is divided into these six parts:

1—"General Instructions," detailing

DON'T REST A GREASY OIL BOTTLE ON THE RUNNING BOARD

IF YOU MUST PUT IT DOWN, PLACE IT ON THE GROUND

Textbook instruction at the station training school of Gaseteria at Indianapolis is simplified through "right" and "wrong" illustrations of points on station selling and servicing. Textbooks are the company's own sales manual and manual of regulations for station salesmen

rules for fire prevention, oil inspection laws, vacations, holidays, group insurance, hold-ups, employe's profit sharing plan, and so on.

2—"General Conduct and Duties," such as the use of liquor, smoking, discussing politics, and personal appearance. It includes a section on the duties of the manager, on such subjects as leadership, handling sales, coupon books, general letters, petty cash, and inventory. Another section is on the duties of the shift men, in handling money, shortages, credits, making out daily reports, and time sheets.

3—"How to Unload Tank Cars," includes such points as testing tanks, return billing, outage charts, and regulation of storage.

4—"Care and Maintenance of Equipment," covers duties employes perform daily, those twice a week, and weekly in the grease room; night duties; signs; driveway care; and minor repairs.

5—"Rules for Handling the Bonded Customer Dividend Plan."

6—"Rules for Bonded Advertising."

This rules and regulations manual is also used as a text book in the training school. Each of its six parts is covered in a 10-question examination for the written quizzes.

The third textbook used in the training school is the company's own method of sales solicitation. The salesman is instructed to make his opening by telling the prospect he would like to talk to him about his transportation costs. The prospect is told that the average motorist spends $200 annually in the service station and is then told of the various savings in buying from the Bonded System station.

The fourth and final text, used in the training school is a book containing the written examinations covering the sales and operating manuals.

This text book also contains written, standard explanations of the company's products and operating policies which the salesman memorizes. Nothing is left to chance. The standard explanations are brief and to the point. If a customer asks a salesman about a Bonded product the salesman does not have to halt and fumble around for the answer. They are all written out, to be memorized, and at the training school the station manager has the explanations recited to him over and over by the men, so they really know them when the course is completed.

Standard explanations are required of all Gaseteria station men on the following questions, for example:

"What is Gaseteria?"

"What is meant by the Bonded System?"

"What is Bonded '70'?"

SPECIFIED ... *by those who know*

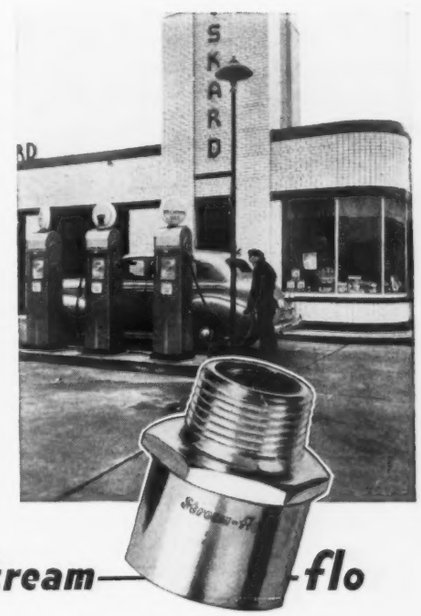
Stream-flo

GASOLINE HOSE COUPLINGS

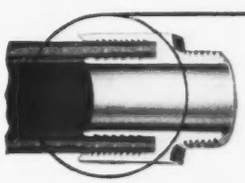
THOSE WHO KNOW . . . specify STREAM-FLO! After exhaustive laboratory and field tests, 18 leading hose manufacturers in the United States and Canada have adopted STREAM-FLO Couplings for their synthetic gasoline and oil hose.

THEY KNOW STREAM-FLO means *proved* economy; fast, efficient fueling! They know that leaks, seepage and wicking, which cause hose to break down at coupling, are all eliminated when STREAM-FLO Couplings are used.

MADE in all sizes from ¾" to 2", *STREAM-FLO* Couplings are *guaranteed* to withstand more than 500 lbs. pressure under tensile, pull or hydrostatic tests.



SPECIFY STREAM-FLO on your next hose order and save *time* as well as money. For not only do *STREAM-FLO* Couplings cost much less, they can be assembled in 15 seconds!



Drop forged, one-piece construction. Cannot slip, pull off or leak.

WRITE FOR CATALOG

THE INTERNATIONAL METAL HOSE CO. INC. 10709-15 QUINCY ST. CLEVELAND, OHIO

TO ENGINE VARNISH

The industry faces a serious problem in engine varnish—that tacky substance which commits sabotage in modern motors. By clinging to the pistons, valves and cylinder walls, it causes serious trouble.

Conewango engineers have licked engine varnish with a new refining process called Selective Adsorption. This process, used *exclusively* for Conewango Process Motor Oil, removes varnish forming ingredients and improves lubricating qualities.

The pistons shown above were run at Pennsylvania State College under identical conditions; the first with a high grade, conventionally refined Pennsylvania oil, the second with Conewango Process Oil of the same S.A.E. grade. Note how Selective Adsorption virtually eliminates varnish formation!

This revolutionary development offers unusual profits to alert dealers and jobbers. Write now for complete information.

Conewango Process
VARNISH FREE
MOTOR OIL

MADE FROM THE HEART OF THE FINEST PENNSYLVANIA CRUDE

THE CONEWANGO REFINING CO.
WARREN, PENNA.

"What is Bonded Ethyl?"
"What is Bonded '68' motor oil?"
"What is Phil-A-Penn motor oil?"
"What is Gear-O?"
"What is cleaners naphtha?"
"Why should I drain my oil?"
"Why should I use hypoid lubricant?"

Other standard explanations required are for example on what to say to a dissatisfied customer, what to say when a customer asks to have his tires inflated while gasoline customers are waiting.

Monthly "Exams" Check Progress After Salesman Goes To Work

Gaseteria's system of developing station salesmen does not stop, however, when they have finished their course at the station school and have been assigned to a definite post. The Williams brothers found that their sales efforts were weakened through men, after they had been with the company for some time, settling back and taking the attitude that "they had arrived" as salesmen and not trying to improve their efforts.

So regular monthly examinations are given the salesman after he has gone to work by his own station manager and written reports on these examinations are filed in the company's office. These reports follow the salesman's improvements in personal qualities as well as his progress in sales work, so the company officials have a continuous and current record on their salesmen. In connection with the report each month on his examination of the salesmen under him, the station manager also files a formal report on points that bring out his ability or lack of ability as a leader, in his relations with each individual salesman under him. Thus the monthly report system serves also as a stimulus to progress to the station managers.

The monthly merit report card on each salesman is filled in by the station manager present and signed by the employe. The manager checks what he thinks is the proper rating on the questions, which have to do with salesmanship, knowledge of products, service, personal appearance, solicitation, personal qualities, quality of work and conduct. For some of the questions the ratings are; unusually well informed, well informed, moderately well informed, lacking and does not study. For other questions the ratings are; excellent, good, fair, poor.

The salesman retains a copy of the merit report and, if he feels the ratings are not fair, he has the right to appeal direct to the company.

Before filling in the merit card for the individual salesman, the station manager goes into a conference with himself and fills in an 84-question form entitled, "The Manager's Self Quiz," to test his own merits as a leader. He signs the form and sends it to the main office, along with his salesmen's merit reports. The manager answers each question on his self report by a check mark. There are 42 questions under the heading of "The Ideal Manager" and 42 under the heading of "The Poor Manager." All the questions deal with the manager's qualities of leadership, his ability to get along with his men, his business judgment and his ability to keep abreast of his industry.

Also in connection with the monthly merit report on his salesmen, the station manager has a quiz form of 25 questions, the answers to which draw out whether the salesman is showing progress in performing his duties and in his sales work and also what effort is being made by the station manager to direct the salesman's progress. This quiz form must also be filled out monthly and signed by both the salesman and his manager and sent to the main office, where it also becomes a part of the company's records on the progress of its men.

Heavy Tourist Trade Expected For Southern California

N. P. N. News Bureau

LOS ANGELES, Nov. 18.—Heavy tourist gains, as a result of conflict overseas, were seen this week in Southern California, according to the All-Year Club, official tourist-attracting agency.

Thousands of tourists who usually go abroad, are expected to re-route their vacation schedules in order "to take in the scenic wonders of the southern Pacific Coast."

Such re-routing will increase automobile traffic in Southern California, offlcials stated. Last year, 89 per cent of the automobile traffic to California entered through the southern portion of the state.

The 1938 tourist trade spent an estimated $194,000,000, and the 1939-40 season is expected to reach the $200,000,000 mark, it was said.

In 1938, an estimated 207,920 cars entered the state, carrying 571,454 passengers, according to All-Year Club statistics. Of the cars entering the state, 108,456 cars entered through the southern portion of California.

COLUMBIA, S. C., Nov. 23.—South Carolina's six-cents per gallon gasoline tax brought $1,110,582 in October, officials report, 13 per cent above October, 1938, collections amounting to $979,239.

Standard Rating Adopted For Grease Consistency

CLEVELAND, Nov. 27.—Adoption of a lubricating grease classification is announced by the National Lubricating Grease Institute. It is emphasized that this classification is in no way a standard or specification of quality. It is intended to assure the manufacturer and consumer of lubricating grease of securing uniform bodies or consistencies in grease. In this respect it is comparable to the Society of Automotive Engineers' classification for crank case and gear oils based on viscosity alone.

Whether the classification will come to have any meaning to oil marketers in relation to automotive greases, however, is a question which will receive some consideration in the next few months, when the S.A.E., among other organizations, will examine the classification and its meaning to lubrication of automotive vehicles.

So far the classification by consistency applies almost entirely to industrial greases. A number of comparable classifications have been in use for some years but it was felt there was a need for one which would mean exactly the same to a large group of grease manufacturers. The lubricating grease institute is applying for copyright on its classification, which is as follows:

Grade	A.S.T.M. Worked Penetration Centimeters
No. 0	355—385
No. 1	310—340
No. 2	265—295
No. 3	220—250
No. 4	175—205
No. 5	130—160
No. 6	85—115

The A.S.T.M. worked penetration refers to a tentative method of test of the American Society for Testing Materials designated as D 217-38T. In this test a standard double-pitch cone is allowed to drop a specified distance into the product maintained at a definite temperature. The depth of penetration of the cone into the grease, measured in hundredths of a centimeter, defines any of the figures in the foregoing table. Thus, if the cone drops into a grease 3.55 to 3.85 centimeters (1.4 to 1.5 inches, approximately), it is a No. 0 grade.

This classification becomes effective March 1, 1941. However, it has been indicated that many manufacturers will adopt the classification immediately and already several industrial consumers of grease have adopted it.

Pressure Core Barrel Described In Report

Development of a device to cut and seal core specimens under conditions prevailing in the underground oil reservoir is described in R. I. 3481, report of investigations of the U. S. Bureau of Mines at Washington. It is by D. B. Taliaferro and R. E. Heithecker, petroleum engineers of the bureau's station at Bartlesville, Okla., and was read at the recent annual American Petroleum Institute meeting at Chicago.

The work described is part of an A.P.I. project on a study of methods of determining the oil content of subsurface reservoirs under high pressure and is done under a co-operative agreement between the Bureau of Mines and the A.P.I.

Ethyl to Enlarge Baton Rouge Plant

N. P. N. News Bureau

NEW YORK, Nov. 27.—Manufacturing facilities of Ethyl Gasoline Corp. at Baton Rouge, La., will be enlarged to meet increasing needs of petroleum refiners for higher anti-knock gasoline, according to E. W. Webb, president. Construction work on the expansion program which will result in expenditures of about $4,000,000, will begin immediately.

Project will be contracted for and constructed under the supervision of E. I. du Pont de Nemours & Co.

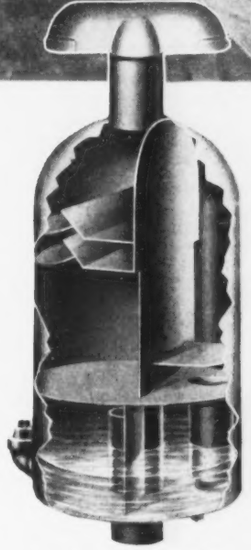
NO Mechanical Parts—
—NO Attention Required

➡ **What explains the nationwide switch to ECONO-VENT? Why has ECONO-VENT already been adopted as standard by America's most exacting bulk storage operators? What advantages can *you* expect from ECONO-VENT? Here is the answer:**

1. ***ECONO-VENT effects a positive saving of 50% to 75% in evaporation and storage losses.***
2. **ECONO-VENT has *no* mechanical parts (no upkeep, no labor costs for inspection).**
3. **ECONO-VENT offers absolute protection against tanks bursting or buckling (operation is positive and unfailing—no danger of parts sticking—no dependence on human element).**
4. **ECONO-VENT minimizes fire hazard . . . keeps out dust and moisture . . . protects quality by retaining light ends.**

Proof? We'll gladly submit it on request. Write today.

LION MFG. CORPORATION
2703 Belmont Avenue **Chicago**



——➤ **ECONO-VENT's advantages are based on a revolutionary new principle of operation—a positive and unfailing principle that assures full protection plus freedom from mechanical attention plus *50% to 75% savings in evaporation and storage losses.* Write for particulars.**

SAVE WITH Econo-vent LIQUID SEAL TANK VENT
THE NEW TYPE TANK VENT WITH THE REVOLUTIONARY *LIQUID SEAL*

Cut
MAINTENANCE COSTS
Eliminate
GAS HAZARDS
The J-W
COMBUSTIBLE GAS INDICATOR
tells definitely when Tanks, Tank Trucks, Stills, Tank Cars, etc., are safe for entry and repair work. Rule-of-thumb cleaning and gas-freeing methods waste time, labor and utilities, and cannot assure
SAFETY

The NEW MODEL "F"—weight, 6¼ lbs.—only 3¼" wide x 6" high—is less than half the size and weight of preceding models and about half the cost.
Write for complete details
JOHNSON-WILLIAMS, LTD.
Palo Alto **California**

52
ISSUES
$3

News . . . Markets . . . Technical developments . . . . Wage-Hour Law rulings and decisions affecting oil . . . Proposed Oil Legislation . . . Merchandising ideas. . in
NATIONAL PETROLEUM NEWS
Every Week

National Petroleum News
Cleveland, Ohio
Send NPN to me for the next 52 weeks. Enclosed is $3 for one year. (Canada $4, Foreign $4.50).

NAME .....
St.-Box .....
City-State .....

New Equipment

AND THE MANUFACTURERS

EMPLOYES' STUDY COURSE — Pittsburgh Equitable Meter Co., Pittsburgh, has inaugurated a course of instruction in the fundamental sciences, which are applied in the natural gas and petroleum industries. Sixty men have enrolled in the course, which is under the Extension Division of Pennsylvania State College. First-year instruction will be in arithmetic, algebra, chemistry and physics, the second year in the problems connected with the production, transmission, regulation measurement and utilization of natural gas and oil products. Instructors are from the engineering department of the meter company, under the direction of A. D. McLean, chief engineer.

* * *

ABSORBS AQUA PUMPS—Neptune Meter Co., New York, on Jan. 1 will acquire all the assets connected with the manufacture of gasoline dispensing pumps from its subsidiary, Aqua Systems, Inc. All the functions of Aqua, except the hydraulic systems business, will be transferred to the corresponding divisions of Neptune. The present Aqua pump will be manufactured and marketed through the Neptune organization and will be known as the "Red Seal" pump.

The Aqua pump sales organization will become part of Neptune sales department. J. R. Van Gorder, vice president and sales manager of Neptune Meter Co., will have charge of pump sales. C. F. Beckwith, who has been eastern sales manager of Aqua Systems Inc., will become eastern district sales manager of the pump department of Neptune Meter Co.

* * *

MADE SALES MANAGER — Williams Oil-O-Matic Heating Corp. announces the appointment of Samuel F. Baker as general sales manager, in charge of oil burner, refrigeration and air conditioning sales. Previous to his joining the Oil-O-Matic organization he was general manager of an internationally known stoker manufacturing company. The company states that Mr. Baker's appointment marks the start of a comprehensive program to build up its organization.

NEW ROTARY TRANSFER PUMP—Erie Meter Systems, Inc., Erie, Pa., have designed a new, larger capacity rotary transfer pump, for handling all types of petroleum products. The new unit is said to have twice the capacity of former models and comes equipped with or without flow type meter. The model illustrated, figure 145-M, is

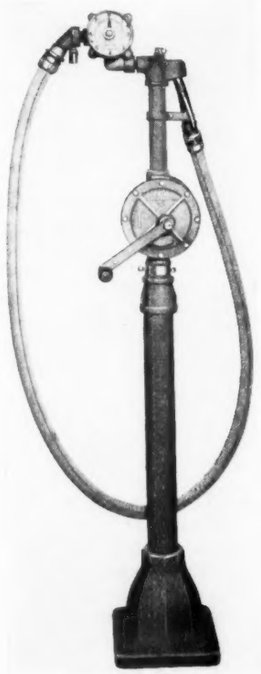


Figure 145-*M*

mounted on pedestal base, and equipped with flow type meter, 8-gallon dial and built-in totalizer, as well as 8 feet of hose for handling gasoline. Another model is constructed for use with barrels or above-ground storage tanks. Modèls for handling kerosine come equipped with shut-off nozzles, instead of gasoline hose.

* * *

CATALOG ON HOSE—A four-page catalog section on oil hose for cargo handling has been published by B. F. Goodrich Co., Akron. It describes four types of dock loading hose, three of barge loading hose and one for sea loading, as well as fittings and what equipment to use in various services.

The Louis Allis Co., Milwaukee, announces expansion of its sales and service facilities by appointment of a Tulsa agent and distributor, Petroleum Engineering and Equipment Co. and The Electric Motor Co. respectively.

* * *

PROPELLING MACHINERY CONTRACT—General Electric Co. has been awarded contract for the propelling machinery for a 19,405-ton-tanker to be built for Atlantic Refining Co. by Sun Shipbuilding. The contract includes both the turbines and electric drive.

* * *

CAR WASHER—The automotive business of the Hardie Manufacturing Co., including its high-pressure car washer, has been taken over by the Kellogg division of the American Brake Shoe & Foundry Co., according to J. F. Weller, president of Kellogg.

* * *

NEW OIL BURNER—The air conditioning division of Gar Wood Industries, Inc., announces production of a new model conversion oil burner for new or existing steam, hot water and warm air home heating plants. A sunflower-shaped flame is produced, it is said, by passing the air across the end of the tube, with adequate rotation causing the air to spread out fan-shape.

* * *

NEW SYNTHETIC HOSE—A line of hose, known as Vitalic '400' has been added to the regular line of the Continental Rubber Works, Erie, Pa. The new product consists of gasoline hose and tank wagon and distillate hose, all of which have a synthetic tube, the company states.

* * *

STORAGE BATTERY—A new storage battery which, it is claimed, will recuperate by standing idle for a few minutes after having been discharged by direct short as many as three or four times is being manufactured by Advance Appliance Co., Peoria, Ill. The battery does not contain the standard acid electrolyte; can be charged at a 45 amp. rate without injury and is not damaged by overcharging, the company states.

* * *

NEW APPOINTMENT—Caterpillar Tractor Co. announces appointment of V. H. Wallace as western sales manager, with headquarters in San Leandro, Cal., succeeding the late H. H. Chambers. He has been assistant sales manager.

* * *

ERECTS NEW BUILDING—Ground has been broken for a new engineering building for Walter Kidde & Co. of New York, makers of carbon dioxide fire extinguishing equipment, to be located on the company's manufacturing site in Bloomfield, N. J. It will add 20,000 square feet to the company's working space and house 110 engineers.

* * *

NEW CATALOG—A three-color, profusely illustrated catalog covering its extensive line of automotive, portable and specialty equipment has been issued by the DeVilbiss Co. of Toledo, O.

* * *

PIPELINE WRAPPING—An improved asbestos wrapper for protecting underground pipelines against physical and chemical action has been developed by the Dearborn Chemical Co., Chicago. It is claimed to have greater tensile strength, dielectric strength and moisture resisting properties and to be resistant to soil action and impervious to fungus growth.

* * *

ACIDSEAL PAINTS—B. F. Goodrich Co., Akron, has just published a four-page catalog section on its line of Acidseal paints, derived from rubber by a process which it developed and patented. These paints are claimed to have unusual properties as protective covering for exteriors of oil and gasoline tanks, for many types of machinery, against the action of acids, alkalies and sulphur fumes and many other uses.

The catalog lists properties of the paints, directions for use and includes exact reproductions of their different colors.

* * *

HYDRAULIC CAR WASHER—Curtis Pneumatic Machinery Co., St. Louis, has brought out a new hydraulic car washer that is of compact design, made in four sizes, from one to three horsepower, and in single and two-gun models, to sell at new low prices.

* * *

PUMP STAYS PRIMED—A. Y. McDonald Mfg. Co., Dubuque, Ia., has brought out a special design of hand rotary pump which is said to insure the pump being primed at all times and eliminates the necessity of a foot valve. The Sta-Prime feature which insures the pump remaining practically full of liquid tends to reduce the possibility of corrosion to minimum.

When it is desired to transfer the pump from one type of liquid to another, a drainage pump is provided on the side-plate of the body which, when removed, permits complete draining of the inside of the pump.

* * *

PROMOTIONS ANNOUNCED—J. F. Joyce, formerly mideast division manager of the merchandising division of Electric Auto-Lite Co. has been appointed national account manager and will be located in Chicago. R. E. Behlin has been appointed mideast division manager, with headquarters in Philadelphia.

HERE'S YOUR **COLD WEATHER** – PROFIT-MAKER!

Let Us Quote on

HIGH FLASH CYLINDER STOCKS

•

SOLVENT DEWAXED NEUTRALS

150 - 180 - 200 - 250 Vis. at 100

•

BRIGHT STOCKS

•

BLENDED MOTOR OILS

In Tank Cars, Drums and Cans

ALLPEN

PERMIT NO. 10

For the thousands who want the *best* in free-flowing 100% Premium Bradford Pennsylvania motor oil . . . at prices based on our sound, widely approved economic policy. Bradford AllPen is zero pour test all year 'round. SAE-10 and 20 are "sub-zero" pour.

A great "buy" for your customers; MORE PROFIT ON OIL for you! Send for samples and unusually favorable price set-up.

Bradford

OIL REFINING COMPANY

PRODUCERS, REFINERS MARKETERS

100% PURE PENNSYLVANIA OIL

BRADFORD PENNSYLVANIA U. S. A.

Markets

Mid-Continent

TULSA, Nov. 25.—Gasoline prices in North Texas and Oklahoma were down 0.125 cent the past week when one North Texas and three Oklahoma refiners reported reducing their quotations in that amount. The lower quotations were due to the "highly competitive situation in middle western markets," refiners said. Texas gasoline that usually moves to the Gulf Coast was said to have been offered in the midwestern market at "below the market prices."

The breathing spell in Mid-Continent lube demand reported last week did not last long enough to allow the accumulation of any stocks, refiners said today. Several refiners said they were sold up and limiting sales to their regular trade. One said he was sold up for the rest of the year, "possibly through January." Export shipments had been "beyond expectations," it was said.

Wax was practically unobtainable for immediate shipment, according to reports. Quotations reported for 124-126 white crude scale were up 0.25 cent at 6.75 cents.

Light fuel oils were in good demand, with supplies closely held. One or two refiners reported increased quotations.

Eastern

NEW YORK, Nov. 25.—Prices for refined products along the Atlantic Coast generally were reported unchanged the past week. High tanker rates from the Gulf were supporting present gasoline prices along the eastern seaboard, some suppliers said.

Demand for fuel oil continued heavy. A 5000-barrel sale of "residual" No. 5 oil was reported at $1.45 a barrel. One supplier said he was offering both "residual" and "distillate" No. 5 oils at New York and Baltimore. His price for "distillate" No. 5 was 20 cents higher, at $1.55, than his "residual" No. 5 price, he said. Quotations reported for No. 5 fuel oil at New York ranged from $1.35 to $1.65.

Gulf

NEW YORK, Nov. 25.—Aside from lower quotations for 72-74 octane leaded gasoline, refined products prices at the Gulf generally were reported unchanged the past week. Current tanker rates were said to have caused some large east coast buyers to switch their purchases from gasoline to crude and this, it was said, was responsible for increased stocks of leaded gasoline at the Gulf.

Prices reported for GCRA specification 72-74 octane leaded gasoline ranged from 6.125 to 6.25 cents, down 0.125 cent on the high. Quotations reported for non-GCRA specifications 72-74 octane leaded ranged from 5.875 to 6.50 cents, off 0.125 cent on the low. A buyer said he had been offered 72-74 octane leaded at 5.75 cents.

Unleaded gasoline was in better shape than leaded gasoline, according to reports in New York. Some inquiries were reported in the market, but, in the opinion of some sellers, they were "more an effort on the part of buyers to keep in touch with the market than a real effort to place business."

Special Notice in Re Mid-Western Tank Car Market

Beginning with the *Oilgram* issue of Dec. 11th (N.P.N. issue Dec. 13th) the prices of refiners and brokers shown under the heading of "Midwestern Tank Car Quotations" which are gathered from refiners and brokers who have plants, headquarters or offices in the general Chicago area, will be shown separately.

In the price table under a new heading of "Mid-Western Refinery Tank Car Quotations" will be the quotations or any sales prices reported by those refiners thus covered from *Oilgram's* Chicago office.

In the news leads will be reported the prices or the discounts or other differentials above or below refiners' prices as furnished by brokers or other tank car sellers.

This change does not reduce the amount of price information given by *Oilgram* from Chicago area, but does make that information more precise and informative as to what refiners and other tank car sellers are doing.

N.P.N. Gasoline Index

	Dealer T.w. Cents per	Tank Car Gallon
Nov. 20	9.64	6.21
Month Ago	9.83	6.25
Year ago	9.66	5.50

Dealer index is an average of "undivided" dealer prices, ex-tax, in 50 cities.

Tank car index is a weighted average of 9 wholesale markets for regular-grade gasoline.

Mid-Western

CHICAGO, Nov. 25.—Prices 0.125 to 0.25 cent lower for low octane gasolines were reported in the Mid-Western market the past week. A Chicago tank car marketer reported offering 62 octane and below 0.25 cent lower at 4 cents and 63-66 octane 0.125 cent lower at 4.25 cents. Other quotations reported for both of these grades ranged up to 4.75 cents. Open spot sales of 16 cars of gasoline, mostly 70-72 octane leaded, were reported during the week. Quotations for this grade ranged from 4.75 to 5.375 cents.

Reports generally indicated fairly heavy movement of all grades of burner fuels against contracts. Quotations ranges generally were reported unchanged.

Heavy fuel movement also continued good under the stimulus of the high rate of operations at local steel plants. Some southern Illinois refiners said that recent discovery of deep sand production in the field would probably increase the supply of heavy industrial fuel. Group 3 prices reported for heavy fuels were at $0.65 a barrel for No. 5 and $0.45 for No. 6.

California

LOS ANGELES, Nov. 25.—West Coast suppliers generally reported a quiet week in refined oil markets. Quotations reported for third-grade gasoline at independent plants ranged upward from 6.25 cents a gallon. Occasional sales were said to have been made at 6 cents.

Domestic demand for kerosine-distillate and gas oil was reported good with prices at around $1.20 a barrel. Most independents were said to be asking around $0.85 a barrel for Bunker "C" fuel oil.

Quotations reported for 30-34 gravity diesel oil (gas oil) for export ranged from $1.25 to $1.45 a barrel. Other export prices were unchanged, according to reports. Marine reports indicated little foreign movement of gasoline and fuel oils against contracts.

Pennsylvania

CLEVELAND, Nov. 25.—Prices for the principal grades of neutral oil and cylinder stocks were up 1 cent a gallon in western Pennsylvania in the short Thanksgiving holiday week. Aside from an 0.125-cent decline in U. S. Motor gasoline in the lower field, prices for other products generally were reported unchanged.

All reports indicated neutral oils continued scarce. The advance in prices came late in the week when one refiner who had been on the low side of the market announced a 1-cent increase in his quotations. As the week ended, quotations reported for 25 pour test 200 vis. No. 3 color neutral ranged from 27 to 32 cents, with 25 pour 150 vis. at 25 to 28 cents. Low pour test

(*Continued on page* 39)

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days) unless otherwise stated. Prices in cents per gallon, except heavy fuel oils in dollars per barrel of 42 gallons, wax and petrolatums in cents per pound in barrels, tank car lots, FOB refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Gasoline

Prices Effective	Nov. 27	Nov. 20
OKLAHOMA		
U. S. Motor: (Oct. L-3)		
62 oct. & below	4.375–4.75	4.50–4.75
63-66 oct.	4.625–5.0625	4.75–5.0625
67-69 oct.	4.625–5.25	4.75–5.25
70-72 oct.	5.125–5.50	5.25–5.50
60-62, 400 e.p.	(h)4.50	(h)4.50
WESTERN PENNA. REFINERS' QUOTATIONS		
Bradford-Warren:		
Motor gasoline:		
U.S. Motor (58-62°)	(e)5.00	(e)5.00
Min. 65 oct.	6.75	6.75
"Q" gasoline	(e)6.75	(e)6.75
73-74 oct. (L-3)	(e)7.00	(e)7.00
75-76 oct. (L-3)	(e)7.30	(e)7.30
Other districts:		
Motor gasoline:		
U. S. Motor (58-62° gravity)	4.75–5.00	4.875–5.00
"Q" gasoline	6.00–6.50	6.25–6.50
CENTRAL MICHIGAN (a)		
Str.-Run Gasoline	(c) 4.50–4.75	(c) 4.50–4.75
U. S. Motor: (Oct. L-3)		
67-69 oct.	(e)6.25	(e)6.25
70-72 oct.	7.00	7.00

Prices Effective	Nov. 27	Nov. 20
CALIFORNIA (3c tax to be added if used state)		
U. S. Motor:		
54-58 gravity, for in-state shipment	6.50–9.25	6.50–9.75
54-58 gravity, for out-side state shipment	6.50–9.00	6.50–9.00
58-61 gravity, 375-400 e.p., 65 oct. & above	7.75–9.75	7.75–9.75
N. TEX. REFINERS' QUOTATIONS (b)		
U. S. Motor: (Oct. L-3)		
62 oct. & below	4.375–4.75	4.50–4.75
63-66 oct.	4.625–5.00	4.75–5.00
67-69 oct.	4.875–5.25	5.00–5.25
70-72 oct.	5.125–5.625	5.25–5.625
60-62, 400 e.p.	(h)4.375	(e)4.50
KANSAS (For Kansas destinations only)		
U. S. Motor: (Oct. L-3)		
62 oct. & below	(e)4.75	(e)4.75
67-69 oct.	(e)5.00	(e)5.00
70-72 oct.	(e)5.50	(e)5.50
W. TEX. REFINERS' QUOTATIONS (b)		
U. S. Motor: (Oct. L-3)		
62 oct. & below	(h) 4.375–4.625	(h) 4.50–4.75
63-66 oct.	(e)4.875	(h) 4.875–5.00
67-69 oct.	4.875–5.125	(h) 5.125–5.375
70-72 oct.	(h) 5.125–5.375	(h) 5.375–5.625

Prices Effective	Nov. 27	Nov. 20
CENT. W. TEX. REFINERS' QUOTATIONS (Prices to truck transports)		
U. S. Motor: (Oct. L-3)		
62 oct. & below	(h)4.50	(h)4.50
63-66 octane	(e)5.125	(e)5.125
66-70 octane	(i)	(i)
E. TEX. REFINERS' QUOTATIONS		
U. S. Motor: (Oct. L-3)		
70-72 oct.	(e)5.00	(e)5.00
60-62, 400 e.p.	(e)4.75	(e)4.75
N. LA. REFINERS' QUOTATIONS (For shipment to La. & Ark.)		
U. S. Motor: (Oct. L-3)		
62 oct. & below	(h) 4.75–5.00	(h) 4.75–5.00
63-66 oct.	(e) 5.00–5.25	(e) 5.00–5.25
70-72 oct. leaded	(h) 5.50–5.75	(h) 5.50–5.75
ARKANSAS REFINER'S QUOTATIONS (F.o.b. Ark. plant of one refiner, for shipment to Ark. & La.)		
U. S. Motor: (Oct. L-3)		
62 oct. & below	4.75	4.75
67-69 oct.	5.25	5.25
70-72 oct.	5.50	5.50
OHIO (S. O. Ohio quotations for statewide delivery and subject to exception for local price disturbances)		
70-72 oct.	7.875	7.875

(Continued on next page)

(a) Prices FOB. Central Michigan refinery group basis, for shipment within Mich. Shipments may originate at plants outside Central group. (b) For shipment to Texas and New Mexico destinations; Group 3 prices quoted for northern shipment. (c) Excluding Detroit shipment. (e) One refiner quoting. (f) Two suppliers quoting. (g) To re-sellers holding licenses. (h) Two refiners quoting. (i) No quotations reported.

MID-WESTERN TANK CAR QUOTATIONS

Prices in this Midwestern Tank Car Market table are gathered from refiners and tank car marketers or brokers from their offices located in Chicago and the surrounding territory. While the prices are quoted on a Group 3 (Oklahoma) freight rate basis, this is in accordance with the custom of the oil industry which uses Group 3 as a price basis for the ease of comparing prices even when the material originates in another refining district. Generally when prices are quoted in this Chicago market, the origin of the material is not known at the time the quotation is given, oftentimes even with the quoting refiners who have refineries in more than one refining district. All other gasoline prices are given by and for the particular refining district where the material is made and from which it is shipped.

Gasoline

Prices Effective	Nov. 27	Nov. 20
U. S. Motor: (Oct. L-3)		
62 oct. & below	4.00–4.75	4.25–4.75
63-66 oct.	4.25–4.75	4.375–4.75
67-69 oct.	4.50–5.125	4.50–5.125
70-72 oct.	4.75–5.375	4.75–5.375

Kerosine

41-43 grav. w.w.	3.50–4.00	3.50–4.00
42-44 grav. w.w.	3.625–4.25	3.625–4.25

Fuel and Gas Oils

Prices Effective	Nov. 27	Nov. 20
No. 1 p.w.	3.375–3.75	3.375–3.75
No. 1 straw	3.25–3.375	3.25–3.375
No. 2 straw	3.125–3.25	3.125–3.25
No. 3	3.00–3.125	3.00–3.125
No. 5	(e)$0.65	(e)$0.65
No. 6	$0.45	$0.45
Range oil	3.375–3.875	3.375–3.875

Naphtha and Solvent

Prices Effective	Nov. 27	Nov. 20
(FOB Group 3 as quoted by two Chicago sellers)		
Stoddard solvent	6.375	6.375
Cleaners' naphtha	6.875	6.875
V. M. & P. naphtha	6.875	6.875
Mineral spirits	5.875	5.875
Rubber solvent	6.875	6.875
Lacquer diluent	7.875	7.875

Daily range of gasoline prices as reported in PLATT'S OILGRAM (Week Ended Nov. 24, 1939)

	Nov. 20	Nov. 21	Nov. 22	Nov. 24
U. S. Motor, (Octane Number determined according to L-3 Method in Okla., Texas and Mid-Western Districts):				
62 octane and below:				
Oklahoma	4.50–4.75	4.50–4.75	4.50–4.75	4.375–4.75
(a) North Texas	4.50–4.75	4.50–4.75	4.50–4.75	4.375–4.75
West Texas	(c) 4.50–4.75	(c) 4.50–4.75	(c) 4.50–4.75	(c) 4.50–4.75
Mid-Western (Group 3 basis)	4.25–4.75	4.25–4.75	4.00–4.75	4.00–4.75
63-66 octane:				
Oklahoma	4.75–5.0625	4.75–5.0625	4.75–5.0625	4.625–5.0625
(a) North Texas	4.75–5.00	4.75–5.00	4.75–5.00	4.625–5.25
West Texas	(c) 4.875–5.00	(c) 4.875–5.00	(c) 4.875–5.00	(c) 4.875–5.00
Mid-Western (Group 3 basis)	4.375–4.75	4.375–4.75	4.375–4.75	4.25–4.75
67-69 octane:				
Oklahoma	4.75–5.25	4.75–5.25	4.75–5.25	4.625–5.25
(a) North Texas	5.00–5.25	5.00–5.25	5.00–5.25	4.875–5.25
West Texas	(c) 5.125–5.375	(c) 5.125–5.375	(c) 5.125–5.375	(c) 5.125–5.375
Mid-Western (Group 3 basis)	4.50–5.125	4.50–5.125	4.50–5.125	4.50–5.125
70-72 octane:				
Oklahoma	5.25–5.50	5.25–5.50	5.25–5.50	5.125–5.50
(a) North Texas	5.25–5.625	5.25–5.625	5.25–5.625	5.125–5.625
West Texas	(c) 5.375–5.625	(c) 5.375–5.625	(c) 5.375–5.625	(c) 5.25–5.625
East Texas	(b)5.00	(b)5.00	(b)5.00	(b)5.00
Mid-Western (Group 3 basis)	4.75–5.375	4.75–5.375	4.75–5.375	4.75–5.375
Motor Gasoline, 60-64 octane:				
New York harbor	(e)6.70	(b)6.70	(b)6.70	(b)6.70
Philadelphia district	6.50–6.75	6.50–6.75	6.50–6.75	6.50–6.75
Baltimore district	6.25–6.75	6.25–6.75	6.25–6.75	6.25–6.75
Motor Gasoline, 65 octane & above:				
New York harbor	6.75–7.00	6.75–7.00	6.75–7.00	6.75–7.00
Philadelphia district	6.50–6.75	6.50–6.75	6.50–6.75	6.50–6.75
Baltimore district	6.50–7.00	6.50–7.00	6.50–7.00	6.50–7.00
U. S. Motor, 58-62°:				
Bradford-Warren (Western Penna.)	(b)5.00	(b)5.00	(b)5.00	(b)5.00
Other districts (Western Penna.)	4.875–5.00	4.875–5.00	4.875–5.00	4.875–5.00
Motor Gasoline, Min. 65 octane:				
Bradford-Warren (Western Penna.)	6.75	6.75	6.75	6.75
"Q" Gasoline:				
Bradford-Warren (Western Penna.)	(b)6.75	(b)6.75	(b)6.75	(b)6.75
Other Districts (Western Penna.)	6.25–6.50	6.25–6.50	6.25–6.50	6.25–6.50
73-74 Octane: (L-3)				
Bradford-Warren (Western Penna.)	(b)7.00	(b)7.00	(b)7.00	(b)7.00
75-76 Octane: (L-3)				
Bradford-Warren (Western Penna.)	(b)7.30	(b)7.30	(b)7.30	(b)7.30

(a) For shipment to Texas and New Mexico destinations: Group 3 prices are quoted on northern shipment. (b) One refiner quoting. (c) Two refiners quoting. (d) No quotations reported. (e) Two suppliers quoting.

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). Prices in cents per gallon except heavy fuel oils in dollars per barrel of 42 gallons, tank car lots. FOB refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included, unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Natural Gasoline

(Prices to blenders on freight basis shown below. Shipments may originate in any Mid-Continent manufacturing district.)

Prices Effective	Nov. 27	Nov. 20
FOB GROUP 3		
Grade 26-70	(m)4.25	(m)4.25
FOB BRECKENRIDGE		
Grade 26-70	(m)4.00	(m)4.00
CALIFORNIA (F.o.b. plants in Los Angeles basin) 75-85, 350-375 e.p. for blending	5.50 – 6.00	5.50 – 6.00

Kerosine

WESTERN PENNA. REFINERS' QUOTATIONS		
Bradford-Warren:		
45 grav. w.w.	4.875 – 5.125	4.875 – 5.125
46 grav. w.w.	(e)5.375	(e)5.375
Other districts:		
45 grav. w.w.	4.75 – 5.00	4.75 – 5.00
46 grav. w.w.	4.875 – 5.125	4.875 – 5.125
47 grav. w.w.	5.00 – 5.25	5.00 – 5.25
CENTRAL MICHIGAN (a)		
47-49 gravity w.w.	4.89 – 5.05	4.89 – 5.05
OKLAHOMA		
41-43 grav. w.w.	3.50 – 4.25	3.50 – 4.25
42-44 grav. w.w.	3.625 – 4.625	3.625 – 4.625
KANSAS (For Kansas destinations only)		
41-43 gravity w.w.	(e)4.125	(e)4.125
42-44 gravity w.w.	(e)4.375	(e)4.375
N. TEX. REFINERS' QUOTATIONS (b)		
41-43 grav. w.w.	(e)4.00	(e)4.00
E. TEX. REFINERS' QUOTATIONS		
41-43 grav. w.w.	(e)3.50	(e)3.50
N. LA. REFINERS' QUOTATIONS (For shipment to La. and Ark.)		
41-43 grav. w.w.	(e) 3.75 –4.00	(e) 3.75 –4.00
ARK. REFINER'S QUOTATIONS (F.o.b. Ark. plant of one refiner for shipment to Ark. and La.)		
41-43 grav. w.w.	4.00	4.00
CALIFORNIA		
40-43 grav. w.w.	4.50 – 6.00	4.50 – 6.00

Gas *and* Fuel Oils

WESTERN PENNA. REFINERS' QUOTATIONS		
Bradford-Warren:		
36-40 gravity	(h) 4.625–4.75	(h) 4.625–4.75
Other districts: (Excluding Pittsburgh District Prices)		
36-40 gravity	4.00 – 4.50	4.125– 4.50
CENTRAL MICHIGAN (a)		
P.W. Distillate	4.50 – 5.00	4.50 – 4.75
No. 3 gas oil, Str.	4.25 – 4.50	4.00 – 4.25
U.G.I. gas oil	3.50 – 3.75	3.50 – 3.75
Fuel Oils (Vis. at 100):		
500-700 Vis.	(e)3.25	(e)3.00
300-500 Vis.	(e) 3.25 –3.50	3.00 – 3.25
100-300 Vis.	(e) 3.50 –3.75	(e) 3.25 –3.50
OKLAHOMA		
No. 1 P.W.	3.50 – 3.75	3.375– 3.75
No. 1 straw	(h) 3.375–3.50	(h) 3.25 –3.50
No. 2 straw	(h) 3.25 –3.375	(h) 3.25 –3.375
No. 2 dark	(h)3.25	(h)3.25
U.G.I. gas oil	(h)3.25	(h)3.25
28-30 grav. zero	3.125	3.125
No. 6	(e)$0.45	(e)$0.45
Range oil	3.625	3.375– 3.625
KANSAS (For Kans. destinations only).		
No. 1 p.w.	3.875	3.875
10-14 gravity	(n)	(n)
No. 6 fuel	(h) $0.50–$0.60	(h) $0.50–$0.60
N. TEX. REFINERS' QUOTATIONS (b)		
No. 1 P.W.		
E. TEX. REFINERS' QUOTATIONS		
No. 1 p.w.	(e) 3.375	(e)3.375
N. LA. REFINERS' QUOTATIONS (For shipment to La. and Ark.)		
10-14 grav.	(e $).65–$0.70	(e) $0.65–$0.70
ARK. REFINER'S QUOTATIONS (F.o.b. Ark. plant of one refiner, for shipment to Ark. and La.)		
No. 1	3.75	3.75
No. 2	3.375	3.375
28-32 zero fuel	3.25	3.25
Tractor Fuel	(j) 4.50	(j)4.50

Prices Effective	Nov. 27	Nov. 20
CALIFORNIA		
San Joaquin Valley:		
Heavy fuel	$0.55 –$0.75	$0.55 –$0.75
Light fuel	$0.75 –$0.85	$0.75 –$0.85
Diesel fuel (per gal.)	2.75 – 4.00	2.75 – 4.00
Stove dist. (per gal.)	3.00 – 5.00	3.00 – 5.00
Los Angeles:		
Heavy fuel	$0.55 –$0.90	$0.55 –$0.90
Light fuel	$0.65 –$1.00	$0.65 –$1.00
Diesel fuel (per gal.)	2.75 – 4.00	2.75 – 4.00
Stove dist. (per gal.)	2.75 – 5.00	2.75 – 5.00
San Francisco:		
Heavy fuel	$0.95	$0.95
Light fuel	$1.05	$1.05
Diesel fuel (per gal.)	4.50	4.50
Stove dist. (per gal.)	5.50	5.50

Note: All above heavy fuels meet Pacific specification 400; light fuel, spec. 300; Diesel fuels, spec. 200; and stove distillate, spec. 100.

Neutral Oils

WESTERN PENNA. REFINERS' QUOTATIONS

Important Note: Penna. lube prices reported by refiners as for limited sale to regular customers only.

Viscous Neutrals No. 3 col. (Viscosity at 70° F.)

200 Vis. (180 at 100°) 420-425 fl.		
0 p.t.	(e)33.50	(e)33.50
10 p.t.	(e)32.50	(e)32.50
15 p.t.	(e)31.50	(e)31.50
25 p.t.	27.00 –32.00	26.00 –32.00
150 Vis. (143 at 100) 400-405 fl.		
0 p.t.	(e)31.50	(e)31.50
10 p.t.	(e)30.50	(e)30.50
15 p.t.	(e)29.50	(e)29.50
25 p.t.	25.00 –28.00	24.00 –28.00

SOUTH TEXAS

Vis	Color		
Pale Oils: (*Vis. at 100°F.*)			
100	No. 1½-2½	5.75 – 6.00	5.75 – 6.00
200	No. 2-3	7.50 – 7.75	7.50 – 7.75
300	No. 2-3	8.00 – 8.25	8.00 – 8.25
500	No. 2½-3½	9.00 – 9.25	9.00 – 9.25
750	No. 3-4	9.50 – 9.75	9.50 – 9.75
1200	No. 3-4	9.875–10.50	9.875–10.50
2000	No. 4	10.00 –10.75	10.00 –10.75
Red Oils:			
200	No. 5-6	7.50 – 7.75	7.50 – 7.75
300	No. 5-6	8.00 – 8.25	8.00 – 8.25
500	No. 5-6	9.00 – 9.25	9.00 – 9.25
750	No. 5-6	9.50 – 9.75	9.50 – 9.75
1200	No. 5-6	9.875–10.50	9.875–10.50
2000	No. 5-6	10.00 –10.75	10.00 –10.75

Note: Red oil prices cover oils with green cast; blue cast red oils are slightly lower in some cases.

MID-CONTINENT (Vis. at 100° F.; F.o.b. Tulsa)

Vis.	Color		
Pale Oils:	**(0 to 10 P.P.)**		
60-85	No. 2	6.50 – 7.50	6.50 – 7.50
86-110	No. 2	6.75 – 8.00	6.75 – 8.00
150	No. 3	12.25 –13.75	12.25 –13.75
180	No. 3	13.00 –14.00	13.00 –14.00
200	No. 3	13.50 –14.50	13.50 –14.50
250	No. 3	14.50 –16.00	14.50 –16.00
280	No. 3	15.50 –17.25	15.50 –17.25
300	No. 3	17.50 –17.75	17.50 –17.75
Red Oils:			
180	No. 5	(e)13.50	(e)13.50
200	No. 5	13.00 –14.00	13.00 –14.00
280	No. 5	14.75 –16.00	14.75 –16.00
300	No. 5	(h) 16.25–16.75	(e) 16.25–16.75

Note: Viscous Neutrals, 15-25 p.p. generally are quoted 0.5c under 0-10 p.p. oils. Non-viscous oils, 15-25 p.p., generally are quoted 0.25c under 0-10 p.p. oils.

CHICAGO (Vis. at 100° F.)

Vis.	Color		
(e) Pale Oils 0 to 10 p.p.			
60-85	No. 2	8.25	8.25
86-110	No. 2	8.50	8.50
150	No. 3	12.75	12.75
180	No. 3	14.00	14.00
200	No. 3	14.50	14.50
250	No. 3	15.50	15.50

Prices Effective	Nov. 27	Nov. 20
CHICAGO (Continued)		
(e) Red Oils:		
180	No. 5	13.50	13.50
200	No. 5	14.00	14.00
250	No. 5	14.50	14.50
280	No. 5	15.50	15.50
300	No. 5	17.25	17.25

Note: Viscous oils, 15 to 30 p.p. are quoted 0.5c lower; 60-85 and 86-110 No. 2 non-viscous oils, 15 to 30 p.p., 0.25c lower. To obtain delivered prices in Chicago, add 0.25c per gal.

Cylinder Stocks

MID-CONTINENT (F.o.b. Tulsa)		
Bright Stocks:		
190-200 Vis. at 210° D.	(e)27.00	(e)27.00
150-160 Vis. at 210° D:		
0 to 10 p.p.	23.00 –24.00	23.00 –24.00
10 to 25 p.p.	23.00 –23.50	23.00 –23.50
25 to 40 p.p.	22.50 –23.00	(h) 22.50–23.00
150-160 vis. at 210° F.	21.00 –23.00	21.00 –23.00
120 Vis. at 210° D:		
0 to 10 p.p.	21.75 –23.00	21.75 –23.00
25 to 40 p.p.	(e)21.625	21.625
600 S.R. Dark Green	(e)8.00	(e)8.00
600 S.R. Olive Green	9.00	9.00
631 S.R.	(e)20.00	(e)20.00
Black Oil	(h) 4.00 –5.50	(h) 4.00 –5.50
(e) CHICAGO (Viscosity at 210°)		
Unfiltered Steam Refined:		
140	10.00	10.00
160	11.00	11.00
200	12.00	12.00
Bright stocks, 160 vis. at 210, No. 8 color:		
0 to 10 p.p.	24.75	24.75
15 to 25 p.p.	23.75	23.75
30 to 40 p.p.	23.25	23.25
E filtered Cyl. Stock	14.50	14.50

Note: To obtain prices delivered in Chicago, add 0.25c per gal.

WESTERN PENNA. REFINERS' QUOTATIONS

Important Note: Penna. lube prices reported by refiners as for limited sale to regular customers only.

600 S.R. filterable	15.50 –18.00	14.50 –18.00
650 S.R.	17.00 –20.00	16.00 –20.00
600 fl.	17.50 –21.00	16.50 –21.00
630 fl.	21.00 –24.00	20.00 –24.00
Brt. stk, 145-155 vis. at 210°, 540-550 fl., No. 8 col.		
10 p.t.	28.00 –36.00	28.00 –36.00
15 p.t.	27.00 –35.00	27.00 –35.00
25 p.t.	25.00 –33.00	25.00 –33.00

Petrolatums

WESTERN PENNA. (Bbls., carloads; tank cars, 0.5c per lb. less. One refiner reports he equalizes freight with nearest refinery to destination).		
Snow White	7.625– 8.25	7.625– 8.25
Lily White	6.625– 7.25	6.625– 7.25
Cream White	5.625– 6.25	5.625– 6.25
Light Amber	3.875– 4.50	3.875– 4.50
Amber	3.625– 4.25	3.625– 4.25
Red	3.50 – 3.75	3.50 – 3.75

Wax

WESTERN PENNA. REFINERS' QUOTATIONS In bbls., carloads, N. Y		
122-124 A.m.p., w.c. scale	(e)6.75	(e)6.50
124-126 A.m.p., w.c. scale	6.50 – 6.75	6.50 – 6.75
OKLAHOMA (In bbls. or burlap bags, carloads)		
124-126° A.m.p., w.c. scale	(h)6.75	(h)6.75
CHICAGO QUOTATIONS (FOB Chicago district refinery of one refiner, in bags or slabs loose, carloads. Melting points are E.M.P. (A.S.T.M.) methods; add 3° F. to convert into A.m.p.)		
Fully refined:		
122-124 (bags only)	6.10	6.10
125-127	6.10	6.10
127-129	6.35	6.35
130-132	6.65	6.65
132-134	6.90	6.90
135-137	7.65	7.65

(a) Prices FOB. Central Michigan refinery group basis, for shipment within Mich. Shipments may originate at plants outside Central group. (b) For shipment to Texas and New Mexico destinations; Group 3 prices quoted on northern shipments. (c) Excluding Detroit shipment. (e) One refiner quoting. (f) No quotations reported. (g) To resellers holding licenses. (h) Two refiners quoting. (j) For shipment to Ark. points only. (k) Two suppliers quoting. (l) Quotations. (m) Sales. (n) No quotations reported.

TANK WAGON MARKETS

Tank car, tank wagon, dealer, and service station prices for gasoline do not include taxes; they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Dealer discounts are shown in footnotes; for commercial consumer discounts, see NPN for March 29, April 12, April 19 and June 7, 1939, or write to N.P.N. These prices in effect Nov. 27, 1939, as posted by principal marketing companies at their headquarters offices, but subject to later correction.

S. O. New Jersey

Essolene
(*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
*Atlantic City, N. J.	7.6	8.7	4	7.6
*Newark, N. J.	7.6	8.7	4	7.6
Annapolis, Md.	8.35	9.35	5	9.50
Baltimore, Md.	7.75	8.75	5	8.5
Cumberland, Md.	9.15	10.15	5	10
Washington, D. C.	8.0	9	3	9.5
Danville, Va.	8.95	11.45	6	12.9
Norfolk, Va.	7.75	10.25	6	11
Petersburg, Va.	8.05	10.55	6	11.7
Richmond, Va.	8.05	10.55	6	10.7
Roanoke, Va.	9.25	11.75	6	11
Charleston, W. Va.	8.55	11.05	6	12.6
Parkersburg, W. Va.	7.85	9.85	6	11.2
Wheeling, W. Va.	8.85	10.75	6	12.2
Charlotte, N. C.	9.9	11.4	7	11.8
Hickory, N. C.	10.45	11.95	7	12.3
Mt. Airy, N. C.	10.3	11.8	7	12.2
Raleigh, N. C.	9.65	11.15	7	11.5
Salisbury, N. C.	9.95	11.45	7	11.9
Charleston, S. C.	7.75	10.25	7	10.6
Columbia, S. C.	8.6	11.1	7	11.5
Spartanburg, S. C.	9.3	11.8	7	12.2

Discount to undivided dealers on Essolene: thru territory, except New Jersey points, which see in "Note" below: Dealer t.w. price less 0.5c per gal.

*Effective Sept. 14, 1939, S. O. New Jersey posted a minimum retail resale price of 11.9c thru New Jersey.

Note: While the above posted prices continue at Atlantic City and Newark, N. J., dealers will pay a net price of 8.6c per gal. for Essolene. Dealers having pumps marked only, Esso, Essolene and "Standard" White gasoline will pay 8.1c per gal. for Essolene.

Kerosine Discount: 1c off t.w. price for 25 gals., or more, under contract thru territory (Baltimore City contract not necessary) except no discount in state of New Jersey.

Socony-Vacuum Oil Co., Inc.

(S. O. New York Division)

Socony Mobilgas
(*Regular Grade*)

	Consumer Tank Car	"Split" Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Metropolitan N.Y.City: Boroughs of Manhattan, Bronx and Brooklyn (Kings and Queens)	7.7	9.2	*5	8.00
Borough of Richmond (Staten Is.)	7.7	8.9	*5	8.00
Albany, N. Y.	7.6	9.6	5	7.8
Binghamton, N. Y.	8.9	9.5	5	8.80
Buffalo, N. Y.	8.1	9.5	5	7.6
Jamestown, N. Y.	7.7	9.5	5	7.7
Plattsburg, N. Y.	8.1	10.4	5	8.40
Rochester, N. Y.	8.3	10	5	8.4
Syracuse, N. Y.	8.2	9.5	5	8.30
Bridgeport, Conn.	7.8	8.8	4	7
Danbury, Conn.	8.3	9.6	4	8.50
Hartford, Conn.	7.9	9.3	4	7.90
New Haven, Conn.	7.8	8.8	4	7
Bangor, Me.	7.9	10	5	8.40
Portland, Me.	7.6	9.3	5	8.00
Boston, Mass.	7.5	9	4	8.00
Concord, N. H.	8.4	10.5	5	8.60
Lancaster, N. H.	9.2	11.5	5	9.40
Manchester, N. H.	8.3	10	5	8.40
Providence, R. I.	7.5	9.3	5	8.00
Burlington, Vt.	8.1	10.2	5	8.20
Rutland, Vt.	8.5	10.5	5	8.40

*Plus 2% city sales tax computed at time of each sale.

Discount to undivided dealers: 0.5c less than "split" dealer t.w.

Atlantic Refining

Atlantic White Flash Gasoline
(*Regular Grade*)

	Commercial Tank Car	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Philadelphia, Pa.	8	9	5	10
Pittsburgh	8	9.5	5	10.5
Allentown	8	9.5	5	10.5
Erie	8	9.5	5	10
Scranton	8.5	10	5	10.5
Altoona	8	10	5	10.5
Harrisburg	8	9.5	5	10.5
Williamsport	8.5	10	5	10.5
Dover, Del.	...	9.5	5	10.5
Wilmington	...	9	5	9.75
Boston, Mass.	...	9	4	8
Springfield, Mass.	...	9	4	8.2
Worcester, Mass.	...	9.5	4	8
Fall River, Mass.	...	9	4	8
Hartford, Conn.	...	9.3	4	8
New Haven, Conn.	...	8.8	4	8
Providence, R. I.	...	9.3	4	8
Atlantic City, N. J.	...	8.6	4	7.6
Camden, N. J.	...	8.6	4	7.6
Trenton, N. J.	...	8.6	4	7.6
Annapolis, Md.	...	9.35	5	9.5
Baltimore, Md.	...	8.75	5	8.5
Hagerstown, Md.	...	9.85	5	10
Richmond, Va.	...	10.55	6	10.7
Wilmington, N. C.	...	10.35	7	10.8
Brunswick, Ga.	...	10	7	*11
Jacksonville, Fla.	...	8	8	10

*Georgia has kerosine tax of 1c per gal., not included in above price.

Discount to undivided dealers: Dealer t.w. less 0.5c per gal. except in Georgia and Florida, dealer t.w. and undivided dealer price is same.

Discounts: At Scranton, Pa., 1c per gal. voluntary discount allowed to dealers only, effective July 8, 1939.

Kerosine discount: Thru Pennsylvania and Delaware, 2c per gal. off t.w. price on t.w. deliveries of 25 gals. or more at one time, effective since Oct. 29, 1936.

S. O. Ohio

Sohio X-70 Gasoline
(Regular Grade)

	Consumer T.W.	†Divided Dlr.	‡S.S.	Gasoline Taxes	Kerosine T.W.
Ohio, Statewide	11	10	13	5	*12
Akron	11	9	13	5	*8.5
Cincinnati	11	10	12	5	*12
Cleveland	11	9	11.5	5	*12
Columbus	11	10	12	5	*12
Dayton	11	10	12	5	*12
Marietta	11	9.5	12	5	*12
Portsmouth	11	10	13	5	*12
Toledo	11	9	11.5	5	*12
Youngstown	11	10	12	5	*11.5

Renown Gasoline
(Third Grade)

Ohio, Statewide	11	10	13	5	....
Akron	11	9	11	5	....
Cincinnati	11	10	12	5	....
Cleveland	11	9	11.5	5	....
Columbus	11	10	12	5	....
Dayton	11	10	12	5	....
Marietta	11	9.5	12	5	....
Portsmouth	11	10	13	5	....
Toledo	11	9	11.5	5	....
Youngstown	11	10	12	5	....

Note: Prices at other Ohio points may be obtained by writing NPN.

*Ohio has kerosine tax of 1c per gal., not included in above prices.

†This price also to authorized agents, exclusive of 0.5c rental.

‡Prices are at company-operated service stations.

Discount to undivided dealers: 0.5c less than divided dealer t.w.

S. O. Kentucky

Crown Gasoline
(*Regular Grade*)

	Consumer T.W.	Net Dlr.	Gasoline Taxes	Kerosine T.W.
Covington, Ky.	12	9	6	9.5
Lexington, Ky.	13.5	10.5	6	10
Louisville, Ky.	12.5	9.5	6	9
Paducah, Ky.	12.5	9.5	6	9
Jackson, Miss.	12.5	9.5	7	*9.5
Vicksburg, Miss.	12.5	9.5	7	*9
Birmingham, Ala.	13.5	10.5	*8	9
Mobile, Ala.	12.5	9.5	*9	9
Montgomery, Ala.	13.5	10.5	*9	*10
Atlanta, Ga.	14	11	7	*8
Augusta, Ga.	13.5	10.5	7	*9
Macon, Ga.	14	11	7	*9.5
Savannah, Ga.	12.5	9.5	7	*8
Jacksonville, Fla.	11	8	8	8
Miami, Fla.	12	9	8	7
Pensacola, Fla.	12.5	9.5	*9	8.5
Tampa, Fla.	12.5	9.5	8	8.5

Kyso Gasoline
(*Third Grade*)

Covington, Ky.	10.5	8	6	....
Lexington, Ky.	12	9.5	6	....
Louisville, Ky.	10	7.5	6	....
Paducah, Ky.	10.5	8	6	....
Jackson, Miss.	11	8.5	7	....
Vicksburg, Miss.	11	8.5	7	....
Birmingham, Ala.	11.5	9	*8	....
Mobile, Ala.	10	7.5	*9	....
Montgomery, Ala.	11.5	9	*9	....
Atlanta, Ga.	11	8.5	7	....
Augusta, Ga.	12	9.5	7	....
Macon, Ga.	12	9.5	7	....
Savannah, Ga.	10.5	8	7	....
Jacksonville, Fla.	9.5	7	8	....
Miami, Fla.	10.5	8	8	....
Pensacola, Fla.	10.5	8	*9	....
Tampa, Fla.	11	8.5	8	....

Discounts to all tank wagon consumers: Effective Jan. 4, 1937, thru territory, on Crown gasoline, 3c per gal. below consumer t.w. price; on Kyso, 2.5c below, regardless of quantity purchased, per month

Taxes: In the tax column is included these city and county gasoline taxes at the following points: Mobile, 2c city; Birmingham, 1c city; Montgomery, 1c city and 1c county; Pensacola, 1c city. Georgia and Montgomery, Ala. have kerosine taxes of 1c per gal., and Mississippi 0.5c, not included in above prices.

S. O. Indiana

Red Crown (*Regular Grade*)
Stanolind (*Third Grade*)

	Red Crown Cons. T.W.	Dealer Prices Red Crown	Stanolind	Gasoline Taxes	Kerosine T.W.
Chicago, Ill.	11.1	9.1	6.9	4	10
Decatur, Ill.	11.1	8.1	6	4	8.5
Joliet, Ill.	11.1	9.6	8.1	4	10
Peoria, Ill.	11.1	9.6	9.1	4	10
Quincy, Ill.	10.9	9.4	8.5	4	9.8
Indianapolis, Ind.	11.8	10.3	8.9	5	*10
Evansville, Ind.	11.6	10.1	9.4	5	*10.5
South Bend, Ind.	11.8	10.3	9.6	5	*10
Detroit, Mich.	9.6	8.1	7.6	4	7.6
Grand Rapids, Mich.	10	8.5	8	4	9.7
Saginaw, Mich.	10.8	9.3	8.6	4	9.3
Green Bay, Wis.	11.9	10.4	9.9	5	10
Milwaukee, Wis.	11.3	9.8	9.3	5	10.2
La Crosse, Wis.	11.5	10	9.5	5	10.4
Minneapolis-St. Paul	11.5	10	9.5	5	10.4
Duluth, Minn.	11.9	10.4	9.9	5	10.8
Mankato, Minn.	11.5	10	9.5	5	9.9
Des Moines, Ia.	10.9	9.4	7.4	4	*9.8
Davenport, Ia.	11.1	9.6	8.4	4	*10
Mason City, Ia.	11.3	9.8	6.9	4	*10.2
St. Louis, Mo.	10.7	9.2	7.5	*4	8
Kansas City, Mo.	10.4	8.9	6.9	*4	8
St. Joseph, Mo.	10.4	8.9	8.4	4	7.9
Fargo, N. D.	12.7	11.2	10.7	5	11.6
Huron, S. D.	12	10.5	10	5	10.9
Wichita, Kans.	9.3	7.1	6	4	7.9

*Taxes: in the tax column is included these city and state gasoline taxes at following points: Kansas City, St. Joseph and St. Louis, 1c city tax. Kerosine taxes: Indiana has 4c, Iowa 3c per gal. state tax, not included in above prices.

S. O. Nebraska

Standard Red Crown Gasoline
(*Regular Grade*)

	T.W.	Dealer	Gasoline Taxes	Kerosine T.W.
Omaha, Neb.	10.5	7.5	6	9.8
McCook	10.5	8.4	6	9
Norfolk	11.3	9.8	6	9.5
North Platte	11.8	9.9	6	10
Scottsbluff	12.5	9.5	6	11.4

S. O. Louisiana

Essolene
(*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Little Rock, Ark.	7.75	10.25	7.5	10
Alexandria, La.	7.25	9.75	8	*11.5
Baton Rouge, La.	7.25	9.75	8	*9.5
New Orleans, La.	7.25	9.75	*10	*9
Lake Charles, La.	7.25	9.75	8	*11.5
Shreveport, La.	6	8.5	8	*10
Lafayette, La.	7.5	10	8	*10
Bristol, Tenn.	10.75	9.75	8	13
Chattanooga, Tenn.	10	12	8	12
Knoxville, Tenn.	10.5	13	8	13
Memphis, Tenn.	8.5	11	8	11
Nashville, Tenn.	9.5	12	8	11

*Taxes: New Orleans gasoline tax includes 7c state, 1c federal, and 2c parish tax. Louisiana has kerosine tax of 1c per gal.; in addition New Orleans has 1c parish tax, none of which are included in above prices.

Price basis to dealers: Undivided dealers get dealer price, less 0.5c.

Above prices include these inspection fees on both gasoline and kerosine unless otherwise specified, per gallon, figured on basis of 50 gallons per barrel: Alabama, 1/40c on gasoline, 1/2c on kerosine; Arkansas, 1/5c per gal. in a single barrel, 1/20c per gal. in bulk; Florida 1/8c; Illinois, 3/100c; Indiana, 1/5c per gal. in lots up to 25 bbls.; 2/25c per gal. in lots of 25 bbls. or more; Kansas, 1/50c, (3/50c can be charged to meet inspection department expenses); Louisiana, 1/32c; Minnesota, 1/25c; Missouri, 3/100c; Nebraska, 3/100c; Nevada, gasoline, 1/20c; North Carolina, 1/4c; North Dakota, 1/20c; Oklahoma, 2/25c per gal. lots of more than 50, in bbls., 1/5c in lots less than 50 bbls.; South Carolina, 1/8c; South Dakota, 1/10c; Tennessee, 2/5c; and Wisconsin, 3/100c kerosine inspection fee only: Iowa, 3/50c; Michigan, 1/5c per gal.

TANK WAGON MARKETS

Tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes: kerosine taxes, where levied, are indicated in footnotes. Dealer discounts are shown in footnotes; for commercial consumer discounts, see NPN for March 29, April 12, April 19 and June 7, 1939, or write to NPN These prices in effect Nov. 27, 1939, as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

Humble Oil & Refining Co.

Humble Motor Fuel
(Regular Grade)

	*T.W.	S.S.	Gasoline Taxes	Kerosine T.W.
Dallas, Tex	7	11	5	8
Ft. Worth, Tex	7	11	5	7
Houston, Tex	9	13	5	8
San Antonio, Tex	9.5	13.5	5	8

Thriftane
(Leaded, 67 Octane, Purple Gasoline)

Dallas	5.5	9	5	
Ft. Worth	5.5	9	5	
Houston	7.5	11	5	
San Antonio	8	11.5	5	

U. S. Motor Gasoline
(Third Grade)

San Antonio, Tex	8	..	5	

*These tank wagon prices apply to all classes of dealers and consumers.

Continental Oil

Conoco Bronz-z-z (Regular Grade)

	††T.W.	Dealer	Gasoline Taxes	Kerosine ‡T.W.
Denver, Col	10.5	..	5	11.5
Grand Junction, Col	13.5	..	5	15
Pueblo, Col	11	..	5	9
Casper, Wyo	12.5	..	5	11.5
Cheyenne, Wyo	10.5	..	5	13
Billings, Mont	12.5	..	6	13
Butte, Mont	14	..	6	15.5
Great Falls, Mont	13.5	..	6	15.5
Helena, Mont	14.5	..	6	15.5
Salt Lake City, Utah	10.5	10.5	5	16
Boise, Ida	**15.1	**15.1	6	18
Twin Falls, Ida	**15.1	**15.1	6	18
Albuquerque, N. M	10.5	10.5	†6.5	10
Roswell, N. M	9	9	†6.5	8
Santa Fe, N. M	10.5	10.5	*7	10
Ft. Smith, Ark	9.5	..	5	7.5
Little Rock, Ark	9.75	..	7.5	8
Texarkana, Ark	9	..		8
Muskogee, Okla	7	..	5	7
Oklahoma City, Okla	6	..	5	6.5
Tulsa, Okla	7	..	5	7

Demand Gasoline
(Third Grade)

Denver, Col	9.5	..	5	....
Grand Junction, Col	12.5	..	5	....
Pueblo, Col	10	..	5	....
Casper, Wyo	11.5	..	5	....
Cheyenne, Wyo	9.5	..	5	....
Billings, Mont	11.5	..	6	....
Butte, Mont	11	..	6	....
Great Falls, Mont	11.5	..	6	....
Helena, Mont	13.5	..	6	....
Salt Lake City, Utah	9.5	9.5	5	....
Boise, Ida	**14.1	**14.1	6	....
Twin Falls, Ida	**14.1	**14.1	6	....
Albuquerque, N. M	8.5	8.5	†6.5	....
Roswell, N. M	8	8	†6.5	....
Santa Fe, N. M	9.5	9.5	*7	....
Ft. Smith, Ark	7	..	5	....
Little Rock, Ark	7.5	..	7.5	....
Texarkana, Ark	6.5	..	5	....
Muskogee, Okla	6	..	5	....
Oklahoma City, Okla	5.5	..	5	....
Tulsa, Okla	5	..	5	....

†Includes city tax of 0.5c.
*Includes 1c city tax.
‡Prices are in t.w. deliveries to consumers and dealers.
**Prices include 0.1c to cover 1-mill tax for toll bridges.
††T.w. prices in all states except Utah, Idaho and New Mexico are to consumers and dealers.

S. O. California

Standard Gasoline
(Regular Grade)

	T.W.	S.S.	Gasoline Taxes	Kerosine T.W.
San Francisco, Cal	13.5	14.5	4	11.5
Los Angeles, Cal	13	14	4	10
Fresno, Cal	14.5	15.5	4	12.5
Phoenix, Ariz	14	15	6	*12.5
Reno, Nev	15.5	16.5	5	13.5
Portland, Ore	14	15	6	13.5
Seattle, Wash	14	15	6	†13.5
Spokane, Wash	15.5	16.5	6	†16.5
Tacoma, Wash	14	15	6	†13.5

Flight Gasoline
(Third Grade)

San Francisco, Cal	12	13	4	....
Los Angeles, Cal	11.5	12.5	4	....
Fresno, Cal	13	14	4	....
Reno, Nev	14	15	5	....
Phoenix, Ariz	11	12	6	....
Portland, Ore	12.5	13.5	6	....
Seattle, Wash	12.5	13.5	6	....
Spokane, Wash	13	14	6	....
Tacoma, Wash	12.5	13.5	6	....

*Arizona has kerosine tax of 5c per gal., not included in above prices.

†Washington has 0.25c per gal. tax on kerosine sales, not included in above prices.

Discount to 100% dealers, thru territory, off posted t.w. prices, on gasolines: on Standard Ethyl, Standard Gasoline and Stanavo Aviation, 3c per gal.; on Flight gasoline, 2c.

Canada

PRICES OF IMPERIAL OIL LTD.

Per Imperial Gallon, which is 1.2 U. S. Gallons

3-Star Imperial Gasoline
(Regular Grade)

	T.W.	Gasoline Taxes	Kerosine T.W.
Hamilton, Ont	15.5	8	16
Toronto, Ont	15.5	8	16
Brandon, Man	21	7	22
Winnipeg, Man	19.5	7	20.5
Regina, Sask	18.5	7	20.5
Saskatoon, Sask	21	7	23
Edmonton, Alta	18.9	7	20.9
Calgary, Alta	16	7	18
Vancouver, B. C	16	7	23
Montreal, Que	15	8	15.5
St. John, N. B	14.5	10	18.5
Halifax, N. S	14.5	10	18.5

Discounts to undivided dealers, 1c off t.w. price, except Maritime Provinces where undivided dealers pay t.w. price. Divided dealers pay t.w. price, thru territory.

Aviation Gasoline

Following are tank car, tank wagon or dealer prices, as indicated, of aviation gasoline in several marketing territories.

S. O. OHIO
Thru Ohio
Esso Aviation

	Consumer T.W.	Gasoline Taxes
74 octane	16	5
80 octane	17	5
87 octane	18	5

Discounts: For delivery on contract to hangar operators and resellers: 2c below consumer posted t.w. price, shown above.

S. O. INDIANA
Stanavo Ethyl Aviation Gasoline
73 Octane Number

Chicago, Ill	14.9	
Detroit, Mich	16.5	4
Milwaukee, Wis	15.1	5
Minneapolis, Minn	15.3	5
St. Louis, Mo	14.5	3
Kansas City, Mo	14.2	*4
Fargo, N. D	16.5	4
Huron, S. D	15.8	5

*Includes 1c city tax.

HUMBLE OIL & REFINING CO.
74 Octane Aviation Gasoline, Clear

	Tank Car
FOB Baytown, Tex	8.5

CONTINENTAL OIL CO.
Conoco Special Gasoline

	T.W. & Dealer Price	Gasoline Taxes
Denver, Colo	15	5
Cheyenne, Wyo	15.5	5
Helena, Mont	22.5	6
Salt Lake City, Utah	18	5
Albuquerque, N. M	14	*6.5

*Includes city tax of 0.5c.

S. O. CALIFORNIA
Stanavo Aviation Gasoline

	T.W.	
Phoenix, Ariz	17.5	6
Los Angeles, Cal	15	4
San Francisco, Cal	15.5	4
Reno, Nev	17.5	5
Portland, Ore	16	6
Seattle, Wash	16	6
Spokane, Wash	19	6

Note: For discounts, etc., see note under Standard and Flight gasoline above.

Naphtha (In Tank Wagon)

S. O. NEW JERSEY

	Posted Tank Wagon Prices Mineral Spirits	V.M. & P.
Newark, N. J	11.5	15.5
Baltimore, Md	15.5	....
Washington, D. C	15	....

Discounts: Buyers taking following quantities at one time, get these discounts. Newark, 2c per gal. on 200 gals. or more; less than 200 gals., 0.5c higher price. Baltimore 2c off on 25 to 100 gals. and 3c on over 100 gals. Washington, 2c off to contract buyers.

SOCONY-VACUUM OIL CO.

Buffalo, N. Y	11.5	12.5
*New York City	9.5	10.5
Rochester, N. Y	12.5	12.5
Syracuse, N. Y	12.5	15
Boston, Mass	11.5	11.5
Bridgeport, Conn	11.5	12
Hartford, Conn	11	11.5
Providence, R. I	11.5	12.5

*Prices apply to consumers only in quantities over 1,000 gals. annually. For quantities under 1,000 gals. annually, add 0.5c per gal.

ATLANTIC REFINING CO.

Philadelphia, Pa	12	14.5
Lancaster, Pa	13.5	16
Pittsburgh, Pa	14.5	14.5

Note: Prices for Mineral Spirits also apply to Stoddard Solvent; and prices for V.M.&P. Naphtha apply also to Light Cleaners Naphtha.

Discounts: Philadelphia, 200 gals. or more at one time, 2c per gal. less. Lancaster, contract buyers taking 1,000 gals. or more per year, one drum up, 2c per gal. less; non-contract buyers, 200 gals. or more at one time, 2c per gal. less. Pittsburgh, 500 gals. or more at one time, 2c.

S. O. OHIO

	S.R. Solvent	V.M.&P. Naphtha
Thru Ohio	12.5	13

Note: V.M.&P. naphtha prices also apply on Dry Cleaners naphtha, special Varnolene, Varnolene and Sohio Solvent. Discounts to contract consumers off t.w. price; 300 to 999 gals., 0.5c; 1,000 to 2,499 gals., 0.75c; 2,500 to 4,999 gals., 1c; 5,000 or more gals., 1.5c.

S. O. INDIANA
(Prices include state and federal taxes)

	Oleum Spirits	V.M.&P. Naphtha	Stanisol
Chicago, Ill	16.7	17	16.4
Detroit, Mich	19.7	18.7	20.2
Kansas City, Mo	14.4	15.4	14.9
St. Louis, Mo	14.7	15.7	13.4
Milwaukee, Wis	19.3	20.3	19.8
Minneapolis, Minn	19.5	20.5	18.2

Note: All prices, with exception of Missouri points, include state tax. Prices shown are base prices, before discounts.

Naphtha (In Tank Cars)

In Tank Cars (F. o. b. refinery or seaboard terminal except Ohio, delivered price.)

	V.M.&P. Naphtha	Mineral Spirits
Baltimore	9.50	8.50
New York Harbor	9-9.5	8.75-9
Philadelphia district	10	8.25-9
Boston	9.5	9.5
Providence	9.5	9.5
†Ohio points, delivered	8.75	*8.25

*This is on rubber solvent.
†Ohio prices are those of S. O. Ohio. Its prices for D.C. naphtha, special Varnolene, Varnolene and Sohio Solvent are same as for V.M.&P.

Price Changes

Dates and amounts of changes. See table for full current prices.

Socony-Vacuum—Socony Mobilgas:
T. c. up 0.1c, thru New York and New England except western New York unchanged; and New York City t. w. up 0.3c, Nov. 27.

Kerosine:
Bridgeport t. w. cut 0.2c, Nov. 15.
New Haven t. w. cut 0.5c, Nov. 15.

S. O. Kentucky—Crown Gasoline:
Miami t. w. and net dealer up 0.5c, Nov. 13.

Kyso Gasoline:
Atlanta t. w. and net dealer price cut 1c, Nov. 14.
Miami t. w. and net dealer price up 0.5c, Nov. 13.

Kerosine:
Atlanta cut 1c, Nov. 17.

S. O. Indiana—Red Crown:
Detroit dealer price cut 1c, Nov. 11; up 1.7c, Nov. 18.
Grand Rapids t. w. and dealer price up 0.5c, Nov. 22.

Stanolind Gasoline:
Detroit dealer price cut 0.95c, Nov. 11; up 1.7c, Nov. 18.
Grand Rapids dealer price up 0.5c, Nov. 22.

Kerosine:
Indianapolis t. w. cut 0.7c, Nov. 22.

Fuel Oil

Socony-Vacuum—Nos. 2, 3 and 4:
Rochester t. w. cut 0.2c, Nov. 21.

Pennsylvania

(*Continued from page* 34)

neutrals as quoted by one refiner were reported unchanged.

A 1-cent advance by one refiner also effected a similar increase in lows of price ranges for cylinder stocks. Quotations for 600 s.r. ranged upward from 15.50 cents; for 650 s.r., upward from 17 cents.

Upper field refiners reported good demand for gasoline, kerosine and fuel oil. Reports from lower field refiners indicated the call for all three products was negligible. U. S. Motor was offered 0.125 cent lower at 4.875 cents by two refiners. Others said they were still asking 5 cents.

Subscribers' Advice Wanted

Oilgram has been discussing with some Pennsylvania refiners introducing a special average price figure which they might use in their contracts. That figure would be say a ten-day running average of prices on the leading Bright Stock and Neutral grades and it would be the average of the high and low of the ten days from and including each publication day and the daily average averaged for the ten days; then each day that day's average would be picked up and the first day—ten days back—would be dropped. Buyers and sellers using this running ten day average probably would agree between themselves for adjustment in the average in case of a crude price change during the ten day period.

The advantage urged for this running ten day average is that it minimizes any fluctuation in prices and rests a contract price on a foundation of ten days of prices instead of on just one day's prices.

If the trade wishes it and will use it, *Oilgram* will be glad to incorporate this running ten day average on say 25 P. T. Bright and Neutrals for Pennsylvania every day in addition to all present prices. If the idea is generally adopted for Pennsylvania perhaps the trade will wish it used in other markets.

Will our subscribers please address their comments and suggestions on this to our Cleveland office.

Coming Meetings

National Fire Protection Assn., Hotel Stevens, Chicago, Dec. 4-6.

American Society of Mechanical Engineers, Philadelphia, Pa., Dec. 4 to 7.

17th Exposition of Chemical Industries, Grand Central Palace, New York, Dec. 4 to 9.

Nebraska Petroleum Marketers, Inc., Annual Convention and Exhibit, Hotel Fontenelle, Omaha, Dec. 5-7.

New Jersey Oil Trades Assn., annual meeting and banquet, Robert Treat Hotel, Newark, N. J., Dec. 7.

Mid-Continent Oil & Gas Assn., General Assn. Standing Tax Committees, Rice Hotel, Houston, Dec. 7-8.

Petroleum Electric Power Assn., Texas State Hotel, Houston, Tex., Dec. 14, 15.

Mid-Continent Oil & Gas Assn., Annual Meeting of General Board of Directors, Tulsa Club Roof, Tulsa, Dec. 18.

West Central Texas Oil & Gas Assn., Abilene, Tex., some time in December.

1940

Society of Automotive Engineers, Annual meeting and Engineering Display, Book-Cadillac Hotel, Detroit, Jan. 15 to 19.

Northwest Petroleum Assn., Annual Meetings: North Dakota Division, Gardner Hotel, Fargo, N. D., Jan. 22, 23; Minnesota Division, Nicollet Hotel, Minneapolis, Jan. 25, 26.

American Institute of Mining and Metallurgical Engineers, New York, Feb. 12 to 15.

Kentucky Petroleum Marketers Assn., 14th annual meeting and convention. Brown Hotel, Louisville, Ky., Feb. 14, 15.

Missouri Independent Oil Jobbers Assn., Annual Convention, Elms Hotel, Excelsior Springs, Mo., Feb. 21 and 22.

National Dixie Distributors, Milwaukee, Wis., Feb. 21, 22.

Wisconsin Petroleum Assn., annual meeting and equipment show, Schroeder Hotel, Milwaukee, Feb. 21, 22, 23.

Ohio Petroleum Marketers Assn., Deshler-Wallick Hotel, Columbus, O., Feb. 27, 28 and 29.

Iowa Independent Oil Jobbers' Assn., annual meeting, Hotel Fort Des Moines, Des Moines, March 5-7.

American Society for Testing Materials, Statler Hotel, Detroit, Mich., March 4-8.

American Petroleum Institute, Mid-Continent District, Division of Production, Wichita, Kan., March 14, 15.

American Petroleum Institute, Southwestern District, Division of Production, Houston, Tex., March 28, 29.

Western Petroleum Refiners Assn., Annual Meeting, Allis Hotel, Wichita, Kans., Mar. 31, Apr. 1, 2.

American Chemical Society, Cincinnati, Ohio, April 8-12.

American Assn. of Petroleum Geologists, Stevens Hotel, Chicago, April 10, 11, 12.

American Petroleum Institute, Eastern District, Division of Production, Columbus, O., April 11, 12.

National Petroleum Assn., 37th semi-annual meeting, Hotel Cleveland, Cleveland, O., April 18, 19.

Petroleum Industry Electrical Assn., Dallas, Tex., May 1 to 3.

Natural Gasoline Assn. of America, 19th annual convention, Hotel Tulsa, Tulsa, May 15, 16, 17.

International Petroleum Exposition and Congress, Tulsa, May 18-25.

American Petroleum Institute, 10th Mid-Year Meeting, Fort Worth, Tex., May 27-31.

American Society for Testing Materials, Chalfonte-Haddon Hall, Atlantic City, N. J., June 24-28.

National Safety Congress & Exposition, Hotel Stevens, Chicago, Ill., Oct. 7-11.

Retail Posted Gasoline Prices At Service Stations in 50 Cities

The following price information is obtained from reliable sources but is not guaranteed.

Prices reported in effect as of Nov. 1, 1939

	Net Dealer Price	Indicated Dealer Margin	Total "Gas" Tax*	Apparent Prevlg. Posted Retail Price Incl. Tax
Portland, Me.	8.8	3.7	5.0	17.5
Manchester	9.5	3.5	5.0	18.0
Burlington, Vt.	9.7	2.3	5.0	17.0
Boston	8.5	3.0	4.0	15.5
Providence	8.8	2.7	4.0	15.5
Hartford	8.8	3.0	4.0	15.8
Buffalo	9.0	3.4	5.0	17.4
New York	8.4	3.6	5.0	17.0
Newark	8.1	3.8	4.0	15.9
Philadelphia	8.5	2.5	5.0	16.0
Dover, Del.	9.0	2.0	5.0	16.0
Baltimore	8.25	4.05	5.0	17.3
Washington	8.5	4.0	3.0	15.5
Charleston, W. Va.	10.55	4.05	6.0	20.6
Norfolk, Va.	9.75	4.55	6.0	20.3
Charlotte, N. C.	10.90	3.8	7.0	21.7
Charleston, S. C.	9.25	3.75	7.0	20.0
Atlanta	11.0	4.0	7.0	22.0
Jacksonville	8.0	4.0	8.0	20.0
Birmingham	10.5	4.0	8.0*	22.5
Vicksburg	9.5	5.0	7.0	21.5
Memphis	10.5	4.8	8.0	23.3
Lexington	10.5	4.0	6.0	20.5
Youngstown, O.	9.0	3.0	5.0	17.0
South Bend	10.3	4.2	5.0	19.5
Chicago	9.1	2.32	4.0	15.42
Detroit	7.4	1.9	4.0	13.3
Milwaukee	9.8	4.1	5.0	18.9
St. Paul-Minn'polis	10.0	4.0	5.0	19.0
Fargo, N. D.	11.2	3.5	5.0	19.7
Huron, S. D.	10.5	4.2	5.0	19.7
Omaha	9.4	3.5	6.0	18.9
Des Moines	9.4	4.3	4.0	17.7
St. Louis	9.2	3.5	4.0*	16.7
Wichita	6.6	3.3	4.0	13.9
Tulsa	7.0	4.0	5.0	16.0
Little Rock	9.75	4.25	7.5	21.5
New Orleans	9.25	4.05	8.0	21.3
Houston	9.0	4.5	5.0	18.5
Albuquerque	10.5	4.5	6.5†	21.5
Denver	10.5	4.5	5.0	20.0
Casper, Wyo.	12.5	5.0	5.0	22.5
Butte, Mont.	14.0	4.0	6.0	24.0
Boise, Idaho	15.0	4.0	6.1	25.1
Salt Lake City	12.5	4.5	5.0	22.0
Reno, Nev.	12.5	4.0	5.0	21.5
Phoenix, Ariz.	11.0	4.0	6.0	21.0
San Francisco	10.5	4.0	4.0	18.5
Portland, Oreg.	11.0	4.0	6.0	21.0
Spokane, Wash.	12.5	4.0	6.0	22.5
Average 50 Cities	9.87	3.78	5.42	19.07

* Includes 1c city tax. † Includes 0.5c city tax.

TANK WAGON MARKETS. HEATING OILS

Prices in Effect Nov. 27, 1939

Following are posted tank wagon prices of various grades of heating oil at the points shown in various territories. Prices are in cents per gallon.

	No. 1	No. 2	No. 4
S. O. NEW JERSEY			
Atlantic City, N. J.	7.6	6.6	6.6
Newark	7.6	6.6	6.6
Annapolis, Md		6.75	
Baltimore	7.25	6.75	6.25
Washington, D. C.	7.5	7	7
Norfolk, Va.	7.25	6.25	6.25
Petersburg	7.5	6.5	....
Richmond	7.5	6.5	6.5
Charlotte, N. C.	9	7.75	....
Hickory	....	8.25	....
Raleigh	9	7.5	....
Charleston, S. C.	8	6.5	....
Columbia	9	7.5	....
Spartanburg	9.7	8.2	....

	Nos. 2 & 3	No. 4
SOCONY-VACUUM OIL CO. INC. (S. O. New York Division)		
New York City	6.50	6.50
Albany, N. Y.	6.70	6.20
Rochester, N. Y.	7.50	7.50
Boston, Mass.	6.70	6.70
Bangor, Me.	7.10	7.10
Manchester, N. H.	7.00	7.00
Burlington, Vt.	7.40	7.40
Hartford, Conn.	6.80	6.80
New Haven, Conn.	6.70	6.70
Providence, R. I.	6.70	6.70

Note: Prices for No. 1 fuel in Socony-Vacuum territory same as for kerosine which see in tank wagon table for various cities; prices change with kerosine.

ATLANTIC REFINING

	Numbers 1	2	3	4	5	6
Phila., Pa.	7.75	6.25	6.25	6.25	4.00	3.25
Allentown, Pa.	8.5	6.25	6.25	6.25	....	....
Wilmington, Del.	7.75	6.25	6.25	6.25	....	....
Springfield, Mass.	8.2	7.2	....	....	....	....
Worcester, Mass.	8	7	....	7	....	....
Hartford, Conn.	8	6.8	....	6.8	....	....

	No. 1	No. 2	No. 3
S. O. OHIO			
Columbus Division and Cleveland	7.50	7.50	7.00
City of Lima	8.00	8.00	7.00
Rest of Ohio	8.00	8.00	7.50

Note: S. O. Ohio prices are for full compartment hose dumps, bucket dumps are 0.5c per gallon higher.

S. O. INDIANA

	Stanolex Fuel No. 1	Stanolex Furnace
Chicago	(a)6.75	6.75
Indianapolis	....	(b)7.8
Detroit	....	6.6
Milwaukee	8.4	7.7
Minneapolis	7.8	7.8
St. Louis	7.7	(c)6.7
Kansas City	6.8	6.8

(a) For 400 gals. and over; 150 to 399 gals., 7.25c; 1 to 149 gals., 8.25c.

(b) Excluding 4c state tax.

(c) For 400 gals. & over; 100 to 399 gals., 7c; 1 to 99 gals., 8c.

Note: Small-lot deliveries of light fuel oils range up to 2c higher than above quotations.

SEABOARD MARKETS, EXPORT AND COASTWISE

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). In cargo markets, spot shipment is 90 days. Prices in cents per gallon, except heavy fuel oil in dollars per barrel, in tank car lots, f.o.b. refineries or seaboard terminals in districts designated, unless otherwise noted. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Atlantic Coast Refiners' & Tanker Terminal Operators' Quotations (FOB Refineries & Terminals)

MOTOR GASOLINE

Prices Effective Nov. 27

District:	60-64 Oct.	65 Oct.	65 Oct. & Above	68-70 Oct.	72-74 Oct.
N. Y. harbor	(m)6.70	6.75 – 7.00	6.75 – 7.00	6.75 – 7.00	6.75 – 7.70
(a) N. Y. harbor	(m)6.70	6.50 – 6.75	6.50 – 6.75	6.50 – 6.75	6.65 – 7.20
Philadelphia	6.50 – 6.75	6.50 – 6.75	6.50 – 6.75	6.50 – 6.75	6.50 – 8.00
Baltimore	6.25 – 6.75	6.50 – 7.00	6.50 – 7.00	6.50 – 6.75	6.75 – 7.75
Norfolk	(r) 6.625–6.875	(r) 6.75 –7.00	(r) 6.75 –7.00	(r) 6.75 –7.25	(m)7.75
Wilm'ton	6.50 – 6.875	6.50 – 7.00	(r) 6.75 –7.00	6.75 – 7.25	7.00 – 7.85
Char'ston	6.625– 6.875	(r) 6.75 –7.00	(r) 6.75 –7.00	(r) 7.00 –7.25	7.50 – 7.55
Savannah	6.50 – 7.125	6.50 – 7.00	6.50 –7.00	(r) 6.75 –7.50	7.00 – 7.25
Jacksonville	6.50 – 6.875	6.50 – 7.00	(r) 6.50 –7.00	(r) 6.75 –7.25	7.00 – 7.25
Miami	(p) 6.625–6.875	(m)7.00	(m)7.00	(m) 7.00 –7.25	(m)7.25
Tampa	(p) 6.50 –6.875	(m)7.00	(m)7.00	(m) 7.00–7.25	(r)7.25
Pensacola	(m) 6.625–6.875	.....	.....	(m) 7.00 –7.25	.....
Mobile	6.00 –6.50	(m)6.50	(m)6.50	(m) 6.75 –7.00	(r)6.75
Portland	.....	(m)7.40	(r) 7.40 –7.50	.....	7.50 – 7.60
Boston	6.50 – 7.15	6.75 – 7.05	6.75 – 7.15	(r) 6.75 –7.00	6.75 – 7.50
Providence	6.80 – 7.15	(r) 7.00 –7.05	7.00 – 7.15	(m)7.00	7.00 – 7.50

WATER WHITE KEROSINE

District:			
N. Y. harbor	5.10	Jacksonville	5.25-5.375
(a) N. Y. harb.	5.00	Miami	(r) 5.25-5.375
Phila.	5.25	Tampa	5.25-5.375
Baltimore	5.25	Pensacola	(m) 5.25-5.375
Norfolk	5.25 – 5.375	Mobile	(r) 5.125-5.375
Wilm'ton, N.C.	5.25 – 5.50	Portland	5.40
Charleston	(r) 5.25 – 5.375	Boston	5.20
Savannah	5.25 – 5.375	Providence	5.20

FUEL OILS

	N. Y. harb.	N. Y. harb. barges
No. 1	5.10	5.00
Nos. 2-3	4.60	4.50 – 4.75
No. 4	4.60	4.50
No. 5	$1.35 –$1.65	.....
No. 6	$1.15	.....

	Phila. dist.	Balt. dist.
No. 1	5.25	5.25
Nos. 2-3	4.50	4.50
No. 4	4.25 – 4.50	4.25 – 4.50
No. 5	$1.35 –$1.57	$1.35 – $1.55
No. 6	$1.15	$1.15

	Bost. dist.	Prov. dist.
No. 1	5.20	5.20
Nos. 2-3	4.70	4.70
No. 4	4.70	4.70
No. 5	$1.45	$1.40 –$1.45
No. 6	$1.15	$1.15

District:	(c) Bunker C Fuel	(c) Diesel Oil
N. Y. harbor	$1.15	$1.90
Philadelphia	$1.15	$1.90
Baltimore	$1.15	$1.90
Norfolk	$1.15	$1.90
Charleston	$1.10	$1.90
Savannah	$1.10	$1.995
Jacksonville	$1.10	$1.995
Tampa	$1.05 –$1.10	$1.995
Portland	$1.15	$2.00 –$2.20
Boston	$1.15	$1.90
Providence	$1.15	$1.90

	Diesel Oil Shore Plants	Gas Oil 28-34 Gravity
N. Y. harbor	4.60	4.60 – 4.80
Philadelphia	4.50	4.50
Baltimore	4.50	4.50
Norfolk	4.50	4.50
Charleston	4.50	4.50
Jacksonville	.....	.....
Tampa	.....	.....
Portland	4.90	4.90 – 5.00
Boston	4.70	4.70 – 4.80
Providence	4.70	4.70 – 4.80

Pacific Export

(c) (Quotations at seaboard, Los Angeles, cargo lots, cents per gal., except where otherwise noted.)

Prices Effective	Nov. 27		Nov. 20	
U. S. Motor, under 65 octane	5.75 – 6.00		5.75 – 6.00	
400 e.p. blend, 65 oct. min	6.00 – 6.25		6.00 – 6.25	
390 e.p. blend, 66 oct.	6.125– 6.375		6.125– 6.625	
390 e.p. blend, 68 oct.	6.25 – 6.50		6.25 – 6.50	
375 e.p. blend, 70 oct.	6.375– 6.75		6.375– 6.875	
(d) 38-40 gravity, w.w. kerosine	4.25 – 5.00		4.25 – 5.00	
41-43 grav., w.w. kero.	4.50 – 5.00		4.50 – 5.00	
44 grav., w.w. kero.	5.00 – 5.50		5.00 – 5.50	
Cargo lots, per bbl.				
Diesel fuel, 24 & above	$1.25	$1.35	$1.25	$1.35
Diesel fuel, under 24	$1.15	$1.25	$1.15	$1.25
(f) 30-34 grav., diesel (gas oil)	$1.25	$1.35	$1.25	$1.30
(g) Grade C fuel	$0.68	$0.73	$0.68	$0.73

Prices effective	Nov. 27	Nov. 20
In Ships' Bunkers, or deep tank lots, per bbl.:		
(f) Diesel fuel	$1.35 –$1.45	$1.35 –$1.45
(g) Grade C fuel	$0.85 –$0.90	$0.89 –$0.90
Cased Goods: (Per case)		
U. S. M.	$1.45 –$1.55	$1.45 –$1.55
400 e.p. blend, under 65 oct.	$1.50 –$1.60	$1.50 –$1.60
375-400 e.p. blend, 65 oct. & above	$1.69 –$1.70	$1.69 –$1.70
(d) 40-43 grav., w.w. kero.	$1.40 –$1.50	$1.40 –$1.50
Kero., p.w.	$1.35 –$1.45	$1.35 –$1.45

New York Export Quotations

(Cents per gal. in bbls. FAS New York)

CYLINDER OILS (Penna. Products)

Bright stock:		
Light, 25 p.t.	(p) 39.00–41.00	(p) 39.00–41.00
Neutral oil:		
200 3 color, 25 p.t.	(n)39.00	(n)39.00
150 3 color, 25 p.t.	(p) 37.00–42.00	(p) 37.00–41.00
600 s.r., unfilt	(p) 23.00–27.00	(n)26.00
650 s.r., unfilt	(p) 25.00–29.50	(n)28.50
600 fl. s.r.	(p) 26.50–31.50	(n)30.50
630 fl., s.r.	(p) 31.50–35.00	(n)34.00

Seaboard Wax Quotations

(A.S.T.M. Tests. Melting points, however, are A.M.P., 3° higher than E.M.P. Export prices, FAS. c.l. Domestic prices, FOB. refr'ies., in bags, c.l., with 0.2c discount allowed for shipment in bulk, except where noted. Scale solid; fully refined slabs in bags)

Prices Effective	Nov. 27 New York Domestic	Export
124-6 Y.C. scale	(o)	(n)7.00
122-4 W.C. scale	(n)6.50	(o)
124-6 W.C. scale	(p)6.50	(n)7.00
123-5 Fully rfd	(n)6.35	(o)
125-7 Fully rfd	(o)	(n)7.50
128-30 Fully rfd	(o)	(n)7.75
130-2 Fully rfd	(o)	(n)8.00
133-5 Fully rfd	(n&h)7.20	(n)8.50
135-7 Fully rfd	(o)	(n)9.00

	New Orleans Export
124-6 Y.C. scale	(n)7.00
122-4 W.C. scale	(o)
124-6 W.C. scale	(p) 6.75 – 7.00
123-5 Fully rfd	(o)
125-7 Fully rfd	(n)7.50
128-30 Fully rfd	(n)7.75
130-2 Fully rfd	(n)8.00
133-5 Fully rfd	(n)8.50

Gulf Coast Bulk

(FOB ship at Gulf for domestic and export; min. 20,000 bbls.)

Prices quoted by individual GCRA refiners on their products meeting GCRA specifications follow:

Nov. 27

GCRA Spec. Motor Fuels	
65 octane (CFR) unleaded	6.00 – 6.25
68 octane (CFR) unleaded	(p) 6.00 –6.50
70 octane (CFR) unleaded	(n)6.00
72-74 octane (CFR) unleaded	(o)
72-74 octane (CFR) leaded	6.125– 6.25
GCRA Spec. Kerosine & Gas Oils	
Kerosine	(p) 4.50 –4.75
43 or below diesel index gas oil	(n)4.00
43-47 diesel index gas oil	(p) 4.00 –4.125
48-52 diesel index gas oil	(p)4.25
53-57 diesel index gas oil	(p) 4.375–4.50
58 & above	(p) 4.50 –4.75

Prices quoted by refiners for other products follow:

MOTOR GASOLINE

Nov. 27

	60-62 Gravity, 400 e.p.	61-63 Gravity, 390 e.p.	64-66 Gravity, 375 e.p.
60 oct.	5.75 – 6.00	(n)6.00	(n)6.00
65 oct.	6.00 – 6.25	(s)6.25	(n)6.375
68 oct.	6.25 – 6.50	(n)6.50	(n)6.625
72-74 oct. leaded	5.875– 6.50	(n)6.50	(n)6.625

KEROSINE

	Nov. 27	Nov. 20
41-43 grav. w.w.	4.25 – 4.875	4.25 – 4.875

GAS OILS

Gas Oil (i):		
Below 43 diesel index	(n)4.00	(n)4.00
43-47 diesel index	(n)4.125	(n)4.125
48-52 diesel index	4.25 – 4.50	4.25 – 4.50
53-57 diesel index	(p) 4.375–4.75	(p) 4.375–4.75
58 & above	(n)4.50	(n)4.50

LIGHT FUEL OILS

No. 2	4.00 – 4.125	4.00 – 4.125

DIESEL and BUNKER OILS

(c) Diesel Oil	$1.70	$1.70
(c) Grade C bunker oil	$0.90 –$1.00	$0.90 –$1.00
Grade C bunker oil, cargoes	$0.95 –$1.00	$0.95 –$1.00

MID-CONTINENT LUBES

(Cents per gal. at Gulf; in bbls., FAS.; in bulk, FOB terminals)

(*Note*: Refiner quoting low prices shown below for Mid-Continent lubes at Gulf reported Nov. 14 his 1c advance was effective Nov. 13).

	Nov. 27 Barrels	Bulk
190 vis. D. 210 brt. stock	(n)33.50	(n)28.80
200 vis. E 210 brt. stock	(n)32.50	(n)27.80
150 vis. D 210 brt. stock 0-10 p.p.	(p) 30.50–31.00	(p) 25.80–26.00
15-25 p.p.	(p) 29.50–30.00	(p) 24.80–25.00
150 vis. E 210 brt. stock	(n)29.50	(n)24.80
100 vis. D 210 brt. stock 0-10 p.p.	(n)29.50	(n)24.80
15-25 p.p.	(n)28.50	(n)23.80
200 vis. No. 3 col. neutral:		
0-10 p.p.	(n)21.00	(n)16.30
15-25 p.p.	(n)20.50	(n)15.80
180 vis. No. 3 col. neutral:		
0-10 p.p.	(n)20.50	(n)15.80
15-25 p.p.	(n)20.00	(n)15.30

SOUTH TEXAS LUBES

(Vis. at 100° cold test 0, bulk export shipment, FOB terminals.)

	Nov. 27	Nov. 20
Unfiltered Pale Oils:		
Vis. Color		
100 No. 3	5.75 – 6.00	5.75 – 6.00
200 No. 3	7.50 – 8.00	7.50 – 8.00
300 No. 3	8.00 – 8.50	8.00 – 8.50
500 No. 3½	9.00 – 9.50	9.00 – 9.50
750 No. 4	9.50 –10.00	9.50 –10.00
1200 No. 4	9.875–12.00	9.875–12.00
2000 No. 4	10.00	10.00
Red Oils:		
Vis. Color		
100 No. 5-6	5.75 – 6.00	5.75 – 6.00
200 No. 5-6	7.50 – 8.00	7.50 – 8.00
300 No. 5-6	8.00 – 8.50	8.00 – 8.50
500 No. 5-6	9.00 – 9.50	9.00 – 9.50
750 No. 5-6	9.50 –10.00	9.50 –10.00
1200 No. 5-6	9.875–12.00	9.875–12.00
2000 No. 5-6	10.00	10.00

Note: Red oil prices cover oils with green cast; prices for blue cast red oils are slightly lower in some cases.

Tanker Rates

(Approximate freight rates. To Continental ports, shillings per ton of 2240 lbs., British sterling: to U. S. ports cents per bbl.)

	Crude & /or Fuel		Refined Oil & / or Spirits	
	Last Paid	Owners Ask	Last Paid	Owners Ask
Gulf-U.K./Cont.(k)	(q)	(q)	(q)	(q)
Aruba-U.K./Cont.	(q)	(q)	(q)	(q)
Gulf-N. Atlantic (l) (not E. of N.Y.): Hvy., Crude & fuel, (10 to 19.9 gravity	43c	45 to 46c	.....	.....
Light Crude, (30 Grav. or Lighter)	39c	42 to 43c	.....	.....
Gasoline	.....	.....	40c	42 to 45c
Kerosine	.....	.....	40c	44 to 47c
Light Fuel	.....	.....	42c	46 to 49c

(a) In barge lots. (c) Ships' bunkers. Lighterage, additional at some points, not included. (d) 150 fire point. (e) For San Francisco cargo prices, add 5c per bbl. to cargo prices shown above. (f) Pacific Specification 200. (g) Pacific Specification 400. (h) Ship n ent in bags or in bulk. (i) Less than ½ of 1% sulfur. (j) Second-hand barrels. (k) Continental ports in range between Bordeaux and Hamburg, both inclusive. (l) Venezuela loading, same rate: Tampico, 2c to 3c per bbl. additional. (m) One supplier quoting. (n) One refiner quoting. (o) No quotations reported. (p) Two refiners quoting. (q) No rates reported. (r) Two suppliers quoting. (s) Sale.

CRUDE OIL MARKETS

Prices in $ per bbl. of 42 U. S. gals. at the well. A. P. I. gravity. Prices are effective as of 7 a. m. of dates as given

EASTERN FIELDS

Posted by Joseph Seep Purchasing Agency
(Effective Nov. 1, 1939, except Corning Nov. 4, 1939)

Penna. Grade Oil in Southwest Penna. Pipe Lines $2.05
Penna. Grade Oil in Eureka Pipe Lines (West Virginia) $1.99
Corning Oil in Buckeye Pipe Lines (Ohio) .. $1.12

Posted by Other Companies

Tide Water Associated Oil Co.
Bradford-Allegany district (Penna. and N. Y.) (Effective Nov. 1, 1939) $2.40
*The Pennzoil Co.: (Effective Nov. 1, 1939)
Penna. Grade Oil in National Transit Lines *$2.33
*The Pennzoil Co. posts $2.33 in Cochran, Franklin, Hamilton and Doolittle, Pa. fields, prices in other lower districts range down to $2.28 per bbl. at well.

MICHIGAN

Posted by Pure Oil Co.
(Effective Oct. 9, 1939)

Midland, Midland County $1.02
Sherman $0.97
Clare-Freeman $0.97

Posted by Simrall Corp.
(Effective Oct. 9, 1939)

Crystal, Greendale, Porter, Vernon and Wise $1.02
Beaverton, Buckeye, Bentley, Edenville $1.00
Freeman and Redding $0.97
Arenac $0.82
(Effective Nov. 1, 1939)
West Branch $0.85

Posted by Sohio Corp. (Michigan Division)
(Effective Oct. 9, 1939)

Allegan and Kent Counties $1.03
(Effective Nov. 9, 1939)
Van Buren County $1.03

Posted by Bay Pipe Line Corp.
(Effective Oct. 9, 1939)

Bentley and Buckeye $1.00
Saginaw and Wise $1.02
Clare $0.76

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.
(Effective June 8, 1939)

Illinois and Western Indiana $0.95
Illinois Basin $1.05

Posted by Sohio Corp.

Illinois Basin:
(Effective Oct. 21, 1939)
Salem (Lake Centralia) $1.05
(Effective June 8, 1939)
Balance of Illinois Basin $1.05
(Effective Oct. 10, 1939)
Griffin (Ind.) pool, sand wells $0.95
Griffin (Ind.) pool, McCloskey lime $0.85

Posted by Carter Oil Co.
(Effective June 10, 1939)

Louden, Fayette County, Ill. $1.05

Posted by Ashland Oil & Transportation Co.
(Effective June 9, 1939)

Somerset Oil in Ashland Lines, Kentucky:
Big Sandy River .. $1.02 Kentucky River .. $1.10

Posted by Stoll Oil Refining Co.
(Effective June 10, 1939)

Stoll Pipe Line Oil (Ky.) $0.90

Posted by Fordsville Gathering Line, Inc.
Western Kentucky
(Effective June 9, 1939)

Birk City Area $0.90
Owensboro Area $1.00
Corydon Area (Henderson) $0.90

CANADIAN FIELDS

Posted by Imperial Oil Limited
Western Ontario
(Effective Nov. 6, 1939)

Petrolia ..... $2.10 Oil Springs $2.17

Alberta—Turner Valley
(Prices f.o.b. field tankage)
(Effective Jan. 5, 1938)

Crude Oil

40-40.9°	$1.14	53-53.9	$1.40
41-41.9	1.16	54-54.9	1.42
42-42.9	1.18	55-55.9	1.44
43-43.9	1.20	56-56.9	1.46
44-44.9	1.22	57-57.9	1.48
45-45.9	1.24	58-58.9	1.50
46-46.9	1.26	59-59.9	1.52
47-47.9	1.28	60-60.9	1.54
48-48.9	1.30	61-61.9	1.56
49-49.9	1.32	62-62.9	1.58
50-50.9	1.34	63-63.9	1.60
51-51.9	1.36	64-64.9	1.62
52-52.9	1.38		

Crude Naphtha, 65 grav. & above $2.14

Absorption Gasoline
90% Rec., 20 lb. Reid v.p. $1.94
90% Rec., 17 lb. Reid v.p. $2.08

MID-CONTINENT

Oklahoma-Kansas
*(For effective dates, see footnote)

	S. O. Indiana	Carter Mag-nolia	Shell	Conti-nental Texas Co.	Sin-clair Prairie
Below 21°	$0.70	$0.60	....	....	....
21-21.9	.72	.63	....	....	....
22-22.9	.74	.66	....	....	....
23-23.9	.76	.69	....	....	....
24-24.9	.78	.72	....	....	....
25-25.9	.80	.75	....	....	$0.58
26-26.9	.82	.78	....	....	.63
27-27.9	.84	.81	....	....	.68
28-28.9	.86	.84	$0.86	....	.73
29-29.9	.88	.87	.88	....	.78
30-30.9	.90	.90	.90	....	.82
31-31.9	.92	.92	.92	....	.86
32-32.9	.94	.94	.94	....	.90
33-33.9	.96	.96	.96	....	.96
34-34.9	.98	.98	.98	....	.98
35-35.9	1.00	1.00	1.00	1.00	1.00
36-36.9	1.02	1.02	1.02	1.02	1.02
37-37.9	1.04	1.04	1.04	1.04	1.04
38-38.9	1.06	1.06	1.06	1.06	1.06
39-39.9	1.08	1.08	1.08	1.08	1.08
40 & above	1.10	1.10	1.10	1.10	1.10

*Effective in 1938 by Carter Oil, Oct. 13, posting in Okla. only; Continental Oil, Oct. 11, with lowest grade below 29; Magnolia, Oct. 12, posting in Okla. only; Shell, Oct. 22; S. O. Indiana, Oct. 17; The Texas Co., Oct. 12. Aug. 31, 1939, by Sinclair Prairie.

North-North Central and Central Texas
*(For effective dates, see footnote)

	Stano-lind	Sinclair Texas Co. Conti-nental	Magnolia
Below 21°	$0.60	....	
21-21.9	.62	....	
22-22.9	.64	....	
23-23.9	.66	....	
24-24.9	.68	$0.79	
25-25.9	.70	for	
26-26.9	.72	oil	
27-27.9	.74	below	
28-28.9	.76	29°.	
29-29.9	.78	.81	
30-30.9	.80	.83	
31-31.9	.82	.85	
32-32.9	.84	.87	
33-33.9	.86	.89	
34-34.9	.88	.91	
35-35.9	.90	.93	
36-36.9	.92	.95	
37-37.9	.94	.97	
38-38.9	.96	.99	
39-39.9	.98	1.01	
40 & above	1.00	1.03	

*Effective Oct. 11, 1938 by Continental, in North Tex.; Oct. 12, 1938, by Texas Co. in North & North Central Texas. Texas Co.'s lowest grade is 28-28.9, at $0.79; by Magnolia, Dec. 3, 1938, in N. and N. Central Texas; Oct. 5, 1939 by Sinclair Prairie in Mexia and N. Cent. Texas.

Jefferson County, Texas—Beaumont
(Posted by Magnolia Petroleum Co., Effective Oct. 2, 1939, and by Stanolind Oil & Gas Co., for West Beaumont, Effective Oct. 2, 1939)

Below 20°	$0.86	30-30.9	$1.08
20-20.9	.88	31-31.9	1.10
21-21.9	.90	32-32.9	1.12
22-22.9	.92	33-33.9	1.14
23-23.9	.94	34-34.9	1.16
24-24.9	.96	35-35.9	1.18
25-25.9	.98	36-36.9	1.20
26-26.9	1.00	37-37.9	1.22
27-27.9	1.02	38-38.9	1.24
28-28.9	1.04	39-39.9	1.26
29-29.9	1.06	40 & above	1.28

TEXAS FIELDS

Posted by Humble Oil & Refining Co.
**West Central Texas*
(Effective Aug. 11, 1939)

24-24.9	$0.71	33-33.9	$0.89
25-25.9	.73	34-34.9	.91
26-26.9	.75	35-35.9	.93
27-27.9	.77	36-36.9	.95
28-28.9	.79	37-37.9	.97
29-29.9	.81	38-38.9	.99
30-30.9	.83	39-39.9	1.01
31-31.9	.85	40 & above	1.03
32-32.9	.87		

*Includes Brown, Callahan, Coleman, Comanche, Eastland, Fisher, Haskell, Jones, Shackelford, Stephens, Throckmorton and Young Counties.

Effective Aug. 29, 1939, Shell posted in Fisher county, Tex., prices 3c lower than Humble's West Central Texas prices; Shell's schedule begins with below 25, at $0.68 and ends with 40 & above, at $1.

Note: Effective Oct. 1, 1937, Humble prices are based on 100% tank tables at 60F.

**East Central Texas*
(Effective Aug. 11, 1939)

23-23.9	$0.78	32-32.9	$0.96
24-24.9	.80	33-33.9	.98
25-25.9	.82	34-34.9	1.00
26-26.9	.84	35-35.9	1.02
27-27.9	.86	36-36.9	1.04
28-28.9	.88	37-37.9	1.06
29-29.9	.90	38-38.9	1.08
30-30.9	.92	39-39.9	1.10
31-31.9	.94	40 and above	1.12

Posted by Pan American Pipe Line Co.
(Effective Oct. 2, 1939)

Cayuga, Anderson county $0.78
*Including Anderson, Cherokee, Limestone, Navarro counties.

PANHANDLE TEXAS

	Humble (Aug. 11, 1939)		Texas Co. (Oct. 2, 1939)	
	Gray County	Carson-Hutchinson	Sweet	Sour
28-28.9	$0.72	$0.67	...	...
29-29.9	.74	.69	...	...
30-30.9	.76	.71	...	...
31-31.9	.78	.73	...	...
32-32.9	.80	.75	...	...
33-33.9	.82	.77	...	...
34-34.9	.84	.79	$0.84	$0.79
35-35.9	.86	.81	.86	.81
36-36.9	.88	.83	.88	.83
37-37.9	.90	.85	.90	.85
38-38.9	.92	.87	.92	.87
39-39.9	.94	.89	.94	.89
40 & above	.96	.91	.96	.91

Effective Aug. 31, 1939, Sinclair Prairie met Humble in Panhandle Texas. Dec. 3, 1938, Magnolia posted same schedule as Humble.

EAST TEXAS

By Humble, Shell, Sinclair-Prairie, Stanolind, Gulf, Magnolia, Texas Co., Tide Water-Associated $1.10
*Effective dates: Aug. 11, 1939, by Humble and Tide Water-Associated; Aug. 29, 1939, by Stanolind; Oct. 2, 1939 by Sinclair Prairie; Oct. 5, 1939 by Shell; Oct. 12, 1938, by Magnolia, Texas Co.; Oct. 13, 1938, by Gulf.
*Includes Cherokee, Gregg, Rusk, Smith and Upshur counties.

Posted by Shell Oil Co., Inc.
(Effective Oct. 5, 1939)

Polk County, Tex. (Livingston and Schwab-Wilcox areas) $1.10

NORTHEAST TEXAS
(Posted by Humble, Oct. 2, 1939)

Talco $0.65

(Posted by Magnolia, Oct. 12, 1938)

Cass County and Panola County, Tex.:
Magnolia posts below 25° at $0.73, plus 2c differential for each degree, to top grade of 40 & above, at $1.05.

(Posted by The Texas Co., Oct. 12, 1938)

Cass County $1.05

WEST TEXAS and NEW MEXICO
(a) (For effective dates, see footnote)

	Humble	Stano-lind	Shell	Texas Co. Sinclair (c)
Below 20°	$0.53	...	$0.53	...
20-20.9	.55	...	.55	...
21-21.9	.57	...	.57	...
22-22.9	.59	$0.67	.59	...
23-23.9	.61	for	.61	...
24-24.9	.63	oil	.63	...
25-25.9	.65	Below	.65	$0.65
26-26.9	.67	26°.	.67	.67
27-27.9	.69	.69	.69	.69
28-28.9	.71	.71	.71	.71
29-29.9	.73	.73	.73	.73
30-30.9	.75	.75	.75	.75
31-31.9	.77	.77	.77	.77
32-32.9	.79	.79	.79	.79
33-33.9	.81	.81	.81	.81
34-34.9	.83	.83	.83	.83
35-35.9	.85	.85	.85	.85
36-36.9	.87	.87	.87	.87
37-37.9	.89	.89	for	for
38-38.9	.91	.91	oil	oil
39-39.9	.93	.93	36° &	36° &
40 & above	.95	.95	above.	above.

Posted by Magnolia Petroleum Co.
(Effective Oct. 12, 1938 in West Texas; Oct. 15, 1939 in Lea County, N. Mex.)

	West Texas	N. Mex.		West Texas	N. Mex.
Below 25.	$0.63	$0.63	33-33.9 ..	$0.81	$0.81
25-25.9 ..	.65	.65	34-34.9 ..	.83	.83
26-26.9 ..	.67	.67	35-35.9 ..	.85	.85
27-27.9 ..	.69	.69	36-36.9 ..	.87	.87
28-28.9 ..	.71	.71	37-37.9 ..	.89	for
29-29.9 ..	.73	.73	38-38.9 ..	.91	oil
30-30.9 ..	.75	.75	39-39.9 ..	.93	36 &
31-31.9 ..	.77	.77	40 & over	.95	above
32-32.9 ..	.79	.79			

Note: Magnolia's West Texas postings are in Crane, Glasscock, Howard, Mitchell, Upton and Winkler counties.

Pecos County, West Texas
(Posted by Humble Aug. 11, 1939 and Shell, Aug. 29 '39)

Pecos $0.78
Yates Shallow Pool (Shell only) ..... .65

Posted by Sinclair Prairie Oil Marketing Co.
(Effective Aug. 31, 1939)

Eddy county, N. Mex. $0.77

(a) Effective Aug. 11, 1939 by Humble; Shell Oil, Aug. 29, 1939; by The Texas Co., Oct. 12, 1938; Stanolind, Aug. 29, 1939; Sinclair Prairie, Aug. 31, 1939.

(c) Texas Co. posts $0.65 for below 26; Sinclair Prairie, $0.63 for below 25.

Note: Humble's postings are in these counties: Andrews, Crane, Crockett, Ector, Gaines, Glasscock, Howard, Reagan, Upton, Winkler and Yoakum, West Texas; and Lea county, N. Mex.; Shell, in Crane, Ector, Glasscock, Howard, Upton, Winkler, Yoakum, Lea; Stanolind in Hendrick and Henderson field, Winkler county; Texas Co. in Ward, Winkler and Lea.

Posted by Continental Oil Co.
(Effective Oct. 11, 1938)

Artesia, Jackson and Maljamar pools, New Mexico: gravity schedule beginning with below 29, at $0.61; 29-29.9, at $0.63; plus 2c differential for each gravity, up to 40 & above, at $0.85.

COLORADO

Posted by Continental Oil Co
(Effective Oct. 11, 1938)
Ft. Collins and Wellington

Below 29	$0.81	35-35.9	$0.95
29-29.9	.83	36-36.9	.97
30-30.9	.85	37-37.9	.99
31-31.9	.87	38-38.9	1.01
32-32.9	.89	39-39.9	1.03
33-33.9	.91	40 & above	1.05
34-34.9	.93		

Canon City and Florence, Col $0.90

SOUTH AND SOUTHWEST TEXAS

All Shown Below Posted by Humble Oil & Refining Co.
(Effective Aug. 11, 1939)

Carroll, Clack, Darst Creek, Hilbig, Salt Flat and Zoboroski crudes $0.96
Van crude $0.95
Conroe $1.27
(Effective Oct. 2, 1939)
Flour Bluff and Jim Wells County $1.23
(Effective Sept. 14, 1939)
Hardin, Liberty county $1.10

Oct. 12, '38, Magnolia posted $0.96 in Darst Creek; $0.87 in Luling; $0.99 in Lytton Springs; $1.14 for Cleveland, and $1.02 in Hardin, both in Liberty county, Tex.

Oct. 12, '38, The Texas Co. posted $0.96 in Durst Creek.

(Continued on next page)

CRUDE OIL MARKETS

(Continued from preceding page)

***Anahuac-Dickinson**
(Effective Oct. 2, 1939)

Below 20°	$0.81	30-30.9	$1.03
20-20.9	.83	31-31.9	1.05
21-21.9	.85	32-32.9	1.07
22-22.9	.87	33-33.9	1.09
23-23.9	.89	34-34.9	1.11
24-24.9	.91	35-35.9	1.13
25-25.9	.93	36-36.9	1.15
26-26.9	.95	37-37.9	1.17
27-27.9	.97	38-38.9	1.19
28-28.9	.99	39-39.9	1.21
29-29.9	1.01	40 & above	1.23

*Anahuac-Dickinson includes Cedar Point, Fairbanks, Gillock, Hull, Pierce Junction and Raccoon Bend (shallow sand) and Turtle Bay.

Raccoon Bend (Deep sand crude) Tomball and Satsuma
(Effective Aug. 11, 1939)

22-22.9	$0.95	32-32.9	$1.15
23-23.9	.97	33-33.9	1.17
24-24.9	.99	34-34.9	1.19
25-25.9	1.01	35-35.9	1.21
26-26.9	1.03	36-36.9	1.23
27-27.9	1.05	37-37.9	1.25
28-28.9	1.07	38-38.9	1.27
29-29.9	1.09	39-39.9	1.29
30-30.9	1.11	40 & above	1.31
31-31.9	1.13		

Dec. 3, 1938, Magnolia posted above price and gravity schedule in Tomball. Effective Aug. 29, 1939, Stanolind met Humble in Tomball, except that Stanolind's schedule begins with below 29 at $1.07.

LOUISIANA-ARKANSAS
Posted by Standard Oil Co. of Louisiana
(†) (For effective dates, see footnote)

Gravity	*N. La.-Ark. Sweet	Bunkie-Eola, La.	*South La. Sour	*Ark. Sour	Baton Rouge-University
Below 20 °	....	....	....	....	$0.79
20-20.9	$0.73	$0.83	‡$0.74	$0.63	.82
21-21.9	for	for	.77	for	.85
22-22.9	oil	oil	.80	oil	.88
23-23.9	Below	Below	.83	Below	.91
24-24.9	25°.	25°.	.86	25°.	.94
25-25.9	.75	.85	.89	.65	.97
26-26.9	.77	.87	.92	.67	1.00
27-27.9	.79	.89	.94	.69	1.02
28-28.9	.81	.91	.96	.71	1.04
29-29.9	.83	.93	.98	.73	1.06
30-30.9	.85	.95	1.00	.75	1.08
31-31.9	.87	.97	1.02	.77	1.10
32-32.9	.89	.99	1.04	.79	1.12
33-33.9	.91	1.01	1.06	.81	1.14
34-34.9	.93	1.03	1.08	.83	1.16
35-35.9	.95	1.05	1.10	.85	1.18
36-36.9	.97	1.07	1.12	.87	1.20
37-37.9	.99	1.09	1.14	.89	1.22
38-38.9	1.01	1.11	1.16	.91	1.24
39-39.9	1.03	1.13	1.18	.93	1.26
40 & above	1.05	1.15	1.20	.95	1.28

(Effective Aug. 30, 1939)

Smackover, Ark. $0.73
Cotton Valley Distillate $1.20

*N. La.-Ark. Sweet includes Caddo, Cotton Valley, Cross Lake, De Soto, Haynesville, Homer, Rodessa, Sabine and Sligo, La. crudes, and Miller county, Ark. S. La. Sour includes Choctaw, Darrow, N. Crowley, Roanoke and St. Martinsville. S. Ark. Sour includes Buchner, Magnolia and Village pools.

†N. La.-Ark. Sweet crude and S. La. Sour effective Aug. 30, 1939, except Cross Lake, La., Sept. 7, Baton Rouge-Univ., Sept. 11, and Bunkie and Eola, Oct. 23, 1939; and Ark. Sour, Sept. 13, 1939.

‡For Below 21°.

Effective Sept. 8, 1939, Gulf Refg. Co. met S. O. La's. N. La.-Ark. Sweet prices in Bull Bayou, Caddo, Crichton, De Soto, Haynesville, Homer, and El Dorado.

Posted by Arkansas Fuel Oil Corp.
(Effective Jan. 28, 1937)

Urania, La. $1.02

Posted by Continental Oil Co.
(Effective Oct. 11, 1938)

Tepetate and Ville Platte, La. $1.03

(Effective Jan. 1, 1939)
Abbeville, La.

Below 36	$0.92	38-38.9	$0.98
36-36.9	.94	39-39.9	1.00
37-37.9	.96	40 & above	1.02

Posted by Caddo Crude Oil Purchasing Corp.
(Effective Aug. 14, 1939)

Allison area, Shreveport field $0.95

Lisbon, N. La.
(Effective Sept. 14, 1939)

27-27.9	$0.66	32-32.9	$0.76
28-28.9	.68	33-33.9	.78
29-29.9	.70	34-34.9	.80
30-30.9	.72	35 & above	.82
31-31.9	.74		

Lisbon prices met by Gulf, Sept. 14.

Note: S. O. Louisiana prices in all La.-Ark. fields, effective Oct. 5, 1938, are on 100% tank table basis.

GULF COASTAL FIELDS
(a) (For effective dates, see footnote)

Gravity	Continental Humble Sinclair Stano-lind	Refugio (Humble, Conti-nental)	Crude Texas Co.	Shell
Below 20	$0.86	$0.91	$0.86	(b)$0.79
20-20.9	.88	.93	.88	.81
21-21.9	.90	.95	.90	.83
22-22.9	.92	.97	.92	.86
23-23.9	.94	.99	.94	.89
24-24.9	.96	1.01	.96	.92
25-25.9	.98	1.03	.98	.95
26-26.9	1.00	1.05	1.00	.98
27-27.9	1.02	1.07	1.02	1.00
28-28.9	1.04	1.09	1.04	1.02
29-29.9	1.06	1.11	1.06	1.04
30-30.9	1.08	1.13	1.08	1.06
31-31.9	1.10	1.15	1.10	1.08
32-32.9	1.12	1.17	1.12	1.10
33-33.9	1.14	1.19	1.14	1.12
34-34.9	1.16	1.21	1.16	1.14

(*Continued in next column*)

Gravity	Continental Humble Sinclair Stano-lind	Refugio (Humble, Conti-nental)	Crude Texas Co.	Shell
35-35.9	1.18	1.23	for oil	for oil
36-36.9	1.20	1.25	oil	oil
37-37.9	1.22	1.27	34° & above.	34° & above.
38-38.9	1.24	1.29		
39-39.9	1.26	1.31		
40 & above.	1.28	1.33		

(a) Effective Oct. 2, 1939 by Continental, Humble and Texas Co.; Oct. 3, 1939 by Sinclair and Stanolind; Aug. 29, 1939 by Shell. Stanolind's lowest grade is below 21, at $0.88. Refugio, effective Oct. 2, '39 by Humble.

(b) Shell posts these prices in Iowa district. Black Bayou and White Castle, La.; prices in Iowa district have 2 lower grades: below 18, at $0.75, 18-18.9, $0.77; and 19-19.9, is $0.79.

Note: Humble's Gulf Coast prices apply in these Texas fields: Amelia, Clear Lake, Goose Creek, Mirando which includes Duval, Jim Hogg, Webb and Zapata counties and Heyser and Placedo fields; Mykawa, Sugarland, Thompsons and Webster.

Humble's prices in Refugio include crudes purchased in Saxet, East White Point, Greta, O'Connor-McFadden, Taft, Plymouth and Tom O'Connor fields.

Stanolind's prices apply in Clinton, Hastings, High Island, South Houston and Spindletop. Magnolia posts Mirando, effective Oct. 2, same prices as Humble. Texas Co.'s prices are in Texas and La., Gulf Coast; its prices on Refugio are same as Humble's up to 28 gravity; 28 & above, $1.09; on Duval-Mirando, same as Humble's up to 28; 28 & above, $1.04; it posts Golden Meadow, La., 24-30 grav., $0.90, plus 2c differential, to 40 & above, $1.10.

Posted by Shell Oil Co., Inc.
(Effective Aug. 29, 1939)

Gibson field, Terreborne Parish, La. $1.04

ROCKY MOUNTAIN FIELDS
Posted by Stanolind Oil & Gas Co.
(Effective Oct. 11, 1938)

Salt Creek, (except Tensleep crude), Midway and Dutton Creek, Wyo., same schedule as Stanolind posts in Oklahoma-Kansas, ranging from $0.86 to $1.10, which see under Mid-Continent crude on previous page.

Tensleep, Salt Creek field	$0.646
Iles, heavy	0.92
Elk Basin, light	0.90
Grass Creek, light	0.90
Frannie light	0.55
Grass Creek, heavy	0.40
Hamilton Dome, Wyo.	0.35
Frannie heavy	0.42

Posted by Ohio Oil Co.
(Effective Oct. 11, 1938)

Elk Basin, Wyo.	$0.90
Grass Creek, light	0.90
Rock Creek	1.00
Lance Creek	0.77
Dry Creek, Mont.	0.92

(Effective May 1, 1938)

Grass Creek, heavy	$0.50

(Effective Nov. 16, 1937)

Sunburst, Mont.	$0.90

Posted by Continental Oil Co.
(Effective Oct. 11, 1938)

Cat Creek, Mont.	$1.10
Big Muddy, Wyo.	0.98
Lance Creek, Wyo.	0.77

CALIFORNIA, *Posted by Standard Oil of California*

All gravities above those quoted take highest price offered in the field. Prices effective Feb. 26, 1936, except Huntington Beach, Playa del Rey, Santa Fe Springs, Kern Front, Signal Hill (Long Beach) effective March 7, 1936; Elk Hills effective June 22, 1936; Lakeview Area, Aug. 19, 1936; El Segundo and Wilmington, Oct. 15, 1937; Greeley-Canal, July 9, 1938; Montebello, Aug. 11, 1939. Coles Levee-Richfield Western, Oct. 1, 1939.

Gravity	Signal Hill (Long Beach El Segundo †Wilmington	Seal Beach	Alamitos Heights	Huntington Beach	Inglewood	Playa del Rey	Olinda Brea Canon	Athens Rosecrans	Dominguez	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	‡Mountain View (Newhall and others	Elk Hills	Buena Vista Hills Midway-Sunset Lakeview Area	Greeley-Canal (Kern County)	Lost Hills	Coalinga	Wheeler Ridge	Coles Levee Richfield Western	Santa Maria Val. (Union Oil, Sept. 1 '39)
14-14.9	$0.80	$0.79	$0.74	$0.78	$0.79	$0.80	$0.76	....	....	$0.80	$0.76	$0.76	$0.77	$0 78	....	$0.70	$0.70	$0.70	....	$0.70	$0.70	....	....	$0.42
15-15.9	.80	.79	.74	.78	.79	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	.70	.70	....	.70	.70	....	....	.44
16-16.9	.80	.79	.74	.78	.79	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	.70	.70	....	.70	.70	....	....	.45
17-17.9	.80	.79	.74	.78	.81	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	.70	.70	....	.70	.70	....	....	.46
18-18.9	.80	.79	.74	.78	.84	.80	.78	....	....	.82	.76	.76	.77	.78	....	.70	.70	.70	....	.70	.70	....	....	....
19-19.9	.82	.79	.74	.82	.87	.84	.81	....	....	.85	.76	.78	.77	.78	....	.70	.74	.74	....	.74	.71	.70	....	....
20-20.9	.85	.79	.74	.85	.90	.88	.84	....	....	.88	.78	.82	.77	.80	....	.70	.78	.78	....	.78	.72	.70	....	....
21-21.9	.88	.79	.74	.89	.93	.93	.88	....	....	.91	.80	.85	.77	.84	.78	.73	.82	.82	....	.82	.74	.70	....	....
22-22.9	.92	.82	.74	.92	.96	.98	.92	....	....	.93	.84	.89	.79	.88	.78	.77	.87	.87	....	.86	.78	.72	....	....
23-23.9	.95	.86	.77	.96	.99	1.02	.96	.84	.79	.96	.88	.93	.82	.92	.78	.80	.92	.92	....	.90	.82	.76	....	....
24-24.9	.99	.91	.80	1.00	1.02	1.06	.99	.88	.81	.99	.91	.96	.85	.96	.82	.84	.97	.97	....	.94	.86	.79	....	....
25-25.9	1.03	.95	.82	1.03	1.05	1.11	1.03	.93	.83	1.02	.95	....	.89	.99	.86	.88	1.01	1.01	....	.98	.90	.83	....	....
26-26.9	1.06	1.00	.85	1.07	1.09	1.16	1.06	.98	.86	1.05	.98	....	.93	1.03	.90	.91	1.06	1.06	....	1.02	....	....	....	....
27-27.9	1.10	1.05	.88	1.11	1.12	....	1.10	1.03	.88	....	1.02	....	.97	1.06	.95	.95	1.10	1.10	$0 91	1.06	....	....	$1 00	....
28-28.9	1.14	1.10	.90	1.14	1.15	....	1.14	1.07	.90	....	1.06	....	1.01	1.10	.99	.99	1.15	1.15	.94	1.10	....	....	1 03	....
29-29.9	1.17	1.15	.93	1.18	1.18		1.17	1.12	.93	....	1.09	....	1.06	1.14	1.03	1.02	1.20	1.20	.98	1.14	....	....	1 06	....
30-30.9	1.21	1.19	.95	1.22	1.21		1.21	1.17	.95	....	....	....	1.10	1.17	1.08	1.06	1.25	1.25	1.02	1.18	....	....	1 09	....
31-31.9					1.24		1.24	1.22	.97	....	....	....	1.14	1.21	1.12	1.09	1.29	1.29	1.06				1 13	....
32-32.9		*Elwood Terrace		....	1.27		1.27	1.27	1.00	....	....	....	1.18	1.25	1.16	1.13	1.34	1.34	1.09	Kettleman Hills			1 16	....
33-33.9	....	1.28	....	....	....			1.32	....	....	....	....	1.22	1.28	1.20	1.17	1.38	1.38	1.13	....	1.19	....	1 19	....
34-34.9	....	1.32	....	....	....			1.37	....	....	....	....	1.26	1.32	1.25	1.20	....	....	1.17	....	1.23	....	1 22	....
35-35.9	....	1.35	....	....	....			1.42	....	....	....	....	1.30	....	1.29	....	....	....	1.20	....	1.27	....	1 26	....
36-36.9	....	1.39	....	....	....			1.46	....	....	....	....	1.34	....	1.33	....	....	....	1.24	....	1.31	....	1 29	....
37-37.9	....	1.43	....	....	....			1.51	....	....	....	....	1.38	....	1.37	....	....	....	1.28	....	1.35	....	1 32	....
38-38.9	....	....	....	....	....			1.56	....	....	....	....	1.42	....	1.42	....	....	....	1.31	....	1.39	....	1 35	....
39-39.9	....	....	....	....	....			1.61	....	....	....	....	1.47	....	....	....	....	....	1.35	....	1.43	....	1 39	....
40-40.9	....	....	....	....	....			1.66	....	....	....	....	1.51	....	....	....	....	....	1.39	....	....	....	1 42	....
41-41.9	....	....	....	....	....			....	....	....	....	....	1.55	....	....	....	....	....	1.43	....	....	....	1 45	....
42-42.9	....	....	....	....	....			....	....	....	....	....	1.59	....	....	....	....	....	1.46	....	....	....	1 48	....
43-43.9	....	....	....	....	....			....	....	....	....	....	1.63	....	....	....	....	....	1.50	....	....	....	1 51	....
44-44.9	....	....	....	....	....			....	....	....	....	....	1.67	....	....	....	....	....	1.54	....	....	....	1 55	....
45-45.9	....	....	....	....	....			....	....	....	....	....	1.71	....	....	....	....	....	1.57	....	....	....	1 58	....
46-46.9	....	....	....	....	....			....	....	....	....	....	1.75	....	....	....	....	....	1.61	....	....	....	1 61	....
47-47.9	....	....	....	....	....			....	....	....	....	....	....	....	....	....	....	....	1.65	....	....	....	....	....
48-48.9	....	....	....	....	....			....	....	....	....	....	....	....	....	....	....	....	1.68	....	....	....	....	....

*F. o. b. ship.
‡Mountain View postings begin at $0.70 for 19-19.9; Newhall and others, which include McKittrick, Kern River, Kern Front and Round Mountain begin with 14-14.9 and end with 19-19.9, all posted at $0.70.
†Wilmington prices differ on gravities below 18.9. Prices are: 14-16.9, $0.75; 17-17.9, $0.77; and 18-18.9, $0.79; rest of schedule same as Signal Hill.

Index to Advertisers

This index is published as a convenience to the reader. Every care is taken to make it accurate, but National Petroleum News assumes no responsibility for errors or omissions.

Acheson Colloids Corp.
American Flange & Mfg. Co.
American Safety Tank Co.
American Telephone & Telegraph Co.

Badger & Sons Co., E. B.
Berry Sons' Co., James B.
Blackmer Rotary Pump Co.
Bowser & Co., S. F.
Bradford Oil Refining Co. 33
Brodie Co., Inc., Ralph N.
Buckeye Iron & Brass Works
Butler Manufacturing Co.

Canfield Oil Co.
Champion Spark Plug Co.
Champlin Refining Co. 1
Chicago Bridge & Iron Co.
Chiksan Oil Tool Co., Ltd.
Cities Service Oil Co.
Columbian Steel Tank Co.
Conewango Refg. Co. 30
Curtis Pneumatic Machinery Co.

Davidson Enamel Products, Inc.
Davis Welding & Mfg. Co.
Deep Rock Oil Corp.
Du Pont de Nemours & Co., E. I.

Economy Electric Lantern Co.
Erie Meter Systems, Inc.
Ethyl Gasoline Corp.

Ford Motor Co.
Freedom Oil Co.
Fruehauf Trailer Co.

General American Transportation Corp.
General Electric Co.
General Motors Truck & Coach Division
Giant Tire & Rubber Co.
Gilbert & Barker Mfg. Co.
Goodrich Co., B. F.
Goodyear Tire & Rubber Co.
Granberg Equipment, Inc.
Graver Tank & Mfg. Co., Inc.
Great Lakes Steel Corp.
Gulf Oil Corp.

Hays Mfg. Co.
Heil Co., The
Humble Oil & Refining Co.

International Harvester Co.
International Metal Hose Co., Inc. 29

Johnson-Williams, Ltd. 32

Kellogg Div. of American Brake Shoe & Foundry Co.

Lion Mfg. Corp. 31

McDonald Mfg. Co., A. Y.
Master Electric Co.
Miller Tires
Morrison Bros.

National Petroleum News 32
National Pumps Corp.
Neptune Meter Co.
New York Lubricating Co.

Overhead Door Corp.

Paraflow ..... Fourth Cover
Pennsylvania Petroleum Products Co.
Penola, Inc.
Philadelphia Valve Co.
Pittsburgh Equitable Meter Co.
Platt's Oilgram 2
Pump & Meter Mfg. Co., The
Pure Oil Co.

Roper Corp., Geo. D.

Sani-Flush (The Hygienic Products Co.)
Service Station Equipment Co.
Shell Oil Co., Inc.
Sinclair Refg. Co., Inc.
Skelly Oil Co.
Smith Meter Co. ..... Third Cover
Socony-Vacuum Oil Co.
Southwest Pump Co.
Standard Oil Co. of Calif.
Standard of Indiana
Standard Oil Co. of N. J.
Standard Steel Works
Sun Oil Co.

Texaco Development Co.
Tokheim Oil Tank Co. ..Second Cover

Universal Oil Products Co. 25

Viking Pump Co.

Westinghouse Electric & Mfg. Co. 3
Wheaton Brass Works, A. W.
Wheeling Corrugating Co.
Witte Engine Works

CLASSIFIED

WANTED—A "LIVE-WIRE MERCHANDISER"

"Midwestern manufacturer of service station equipment has position offering real opportunity to a live-wire merchandiser or successful sales manager. Man selected will work directly under management of company, traveling territories with company representatives, establishing new outlets, and developing sales in each area.

"State your qualifications fully, past and present connections, personal details, salary expected, etc. All applications held in strictest confidence.

"Our employees are acquainted with this advertisement.

Reply Box 170"
NATIONAL PETROLEUM NEWS

Positions Wanted

REFINERY SUPERINTENDENT AND ENGINEER desires connection. Thoroughly experienced in the operation, maintenance and construction of all modern refining operations. Atmospheric and vacuum distillation, multi-coil cracking, reforming, gas and poly units, lube and asphalt plants. Successful record. Technically trained. Address Box 172, Care of National Petroleum News.

EXPERIENCED AND CAPABLE MAN, wholesale and retail marketing, major and independent, is open for connection January first with marketer or as direct refinery representative. Prefer south. Address Box 173, National Petroleum News.

For Sale

FOR SALE FIVE 8000 gallon car tanks in excellent condition. Inquiries solicited. Republic Iron and Metal Co., Box 850, Erie, Pa.

ADVERTISEMENT—CALL FOR BIDS To Purchase Royalty Oil Accruing to the United States from the Salt Creek, Wyoming, Oil Field. Sealed proposals, in duplicate, will be received in the office of the Secretary of the Interior, Washington, D. C., on or before noon, December 1, 1939, from responsible bidders for the purchase, beginning January 1, 1940, of royalty oil accruing to the United States from Government lands in the Salt Creek, Wyoming, oil field. Detailed specifications on quantities offered for sale, required form of bids, deliveries, volume measurements, gravity determinations, bond requirements, and action on bids, should be obtained by prospective bidders from the Director, Geological Survey, United States Department of the Interior, Washington, D. C., the Supervisor, U. S. Geological Survey, Casper, Wyoming, on the Register, U. S. Land Office, Cheyenne, Wyoming. Sealed bids are to be submitted to the Secretary of the Interior, Washington, D. C., pursuant to the specifications, the envelope to be marked plainly "Bid on Salt Creek Royalty Oil—Not to be Opened Before Noon, December 1, 1939." No bid received after the time fixed herein for submitting bids will be considered. (Sgd.) E. K. BURLEW, Acting Secretary of the Interior.

Classified Rates

"For Sale," "Wanted to Buy," "Help Wanted," "Business Opportunities," "Miscellaneous" classifications, set in type this size without border — 10 cents a word. Minimum charge, $3.00.

"Position Wanted"—5 cents a word. Minimum charge $1.00.

Advertisements set in special type or with border—$4.00 per column inch.

Copy must reach us not later than Saturday preceding date of issue.

All advertisements carried on this page are payable in advance.

Professional Services

LUBRICATING GREASE TECHNOLOGISTS
Write us for free cost estimate of your problem. Recognized specialists in grease analysis, research, duplication, development, grease formulation, or process investigation.
E. N. KLEMGARD LABORATORY
Pullman, Washington

ANTI-KNOCK VALUES DETERMINATIONS
The Gray Industrial Laboratories
Chemists and Engineers
Specialists on Petroleum Products
961-976 Frelinghuysen Ave.
NEWARK, N. J.
Telephone Bigelow 3-4020

GEORGE A. BURRELL
Petroleum and Gas Engineer
Design Construction Reports
Suite 1909, 20 Pine Street, New York City
1936-42 Fifth Ave. Pittsburgh, Pa.

PHOENIX CHEMICAL LABORATORY
An Exclusive Petroleum Testing Laboratory
Equipped For All Known Tests & Research in Petroleum Products
3953 Shakespeare Ave., Chicago
Telephone—Spalding 3578

HUNTLEY & HUNTLEY
Petroleum Geologists and Engineers
L. G. Huntley J. R. Wylie, Jr.
Grant Building Pittsburgh, Pa.

ROYAL E. BURNHAM
Attorney-at-Law
Patent and Trade Mark Practice Exclusively
511 Eleventh Street, N. W.
Washington, D. C.

"STRICTLY PERSONAL"

A New England Yankee (who still thinks "we" won at Bull Run), **George R. Hopkins,** assistant chief economist of Bureau of Mines' petroleum section, gave proof of his thrifty ancestry as well as his unceasing devotion to golf while in Cleveland last week visiting oil companies and N.P.N. headquarters.

Asked about a well-worn putter he was toting around town, "Hop" said it wasn't to browbeat editors or oil statisticians. "Up at the station," he explained, "they wanted a dime extra to check it with my bag, so I decided to carry it along with me 'til train time." On trips, "Hop" carries a pocketful of golf balls and practices putting on hotel room rugs. The putter, with a plastic wood grip moulded to fit his hand, may explain his prowess in tournaments.

Returning to Washington from the Chicago A.P.I. convention, "Hop" detoured to Salem, Ill., where he saw the Devonian well come in; then to Michigan, visiting 16 refineries in two days. Hopkins' name and figures are known throughout the industry—there aren't many oil reports, weekly, monthly or annually, issued by the Bureau which he doesn't have a hand in in the actual work of supervising.

In Cleveland, he visited with **Sidney Swensrud,** Ohio Standard vice president, then over to National Refining Co. ("Hop" and **Paul Ryan,** National Refining's president, were classmates at Massachusetts Institute of Technology).

* * *

William Frogge, Los Angeles district sales manager for Seaside Oil Co., recently proved his prowess as a sure-eyed huntsman when he bagged his full quota of ducks. A flash from Hollywood's Walt Disney studio states: "Donald was too quick for Bill."

* * *

A. C. Cornish, Standard Vacuum Co.'s general manager at Shanghai, sailed this week for the Orient, after a short visit in California.

* * *

H. Paul Grimm yesterday announced his resignation from the presidency of Bolsa Chica Oil Corp. **Thomas Simmons** moves into the vacancy.

Before heading Bolsa Chica Oil Corp., Mr. Grimm was an official of Pacific Western Oil, and previous to that was an oil umpire in California's valley fields. He is resigning to devote all his time to his private oil interests. However, he will retain his presidency of the Green Bay Co., which operates in New Mexico fields. Mr. Simmons has an interest in several West Montebello leases, and owns production at Redondo.

* * *

Earle W. Gard, Union Oil Company's manager of research and development, was appointed an executive board member of the alumni loyalty fund of the University of Southern California. Mr. Gard was graduated from U.S.C. in 1917.

* * *

Mr. and Mrs. Robert W. Hadlick, of Jefferson City, Mo., both passed the Missouri bar examination recently. Mr. Hadlick is secretary of the Missouri Independent Oil Jobbers' Assn.

* * *

Harry C. Miller, general manager of Pure Oil Co. telephone and telegraph lines, with headquarters in Chicago, retired last week after 22 years service with the company. **Thomas F. Dougherty,** in Mr. Miller's department, has been appointed superintendent of leased telegraph lines, and will be stationed in the company's main office at Chicago.

* * *

William G. Skelly, Tulsa, president of Skelly Oil Co., has been enrolled in Oklahoma's Hall of Fame. The honor was conferred Nov. 16 by Oklahoma Memorial Ass'n. on Mr. Skelly, along with 12 others, for civic achievements. Mr. Skelly flew from the Chicago A.P.I. convention to Oklahoma City were the ceremonies were held.

W. G. Skelly

Joe C. Trees has "caught up with" his partner, **Michael L. Benedum**—both have now passed the three-score-and-ten mark. Last June, Mr. Benedum turned 70 and the occasion was fittingly marked by a birthday party in Pittsburgh. So, on Nov. 10th, when Mr. Trees reached 70, another party was in order. Among the business and industrial leaders attending was **Walter S. Hallahan,** president of Plymouth Oil Co., one of the Benedum-Trees enterprises, and Republican national committeeman.

* * *

Roy S. Reed, of Kansas City, Kanotex Refining Co. salesman, was busy in Chicago attending the annual American Petroleum Institute meeting recently and testifying in federal district court in the case of Jack Russell, Oklahoma outlaw, charged with kidnapping and transporting a kidnap victim across state lines. Russell escaped from the Oklahoma penitentiary at McAlester, Okla., last summer, and is charged with kidnapping a Kansas salesman and murdering him in McHenry county, Illinois, near Chicago. Mr. Reed identified Russell as a hitchhiker seen near Pittsburg, Kansas, shortly after Russell fled the penitentiary.

* * *

Merrill H. Troupe, for several years Baltimore manager for the Indian Refining Co., (Texaco) Lawrenceville, Ill., has joined Beaver Oil Co., Baltimore, in charge of the lubricating oil department, according to **L. L. Niedrach,** president.

* * *

This one was headed "One for Ripley" in the November issue of "Dixie Marketer," publication of Dixie Distributors, Inc., Hillsdale, Mich.:

It was the opening day for small-game hunting. Several members of the Lewis Oil Co., Dixie Distributor of Hillsdale, started off with the dawn, traveling until they came to the company's Wayne station on the Wayne highway, where **L. J. Modisette** was working.

"All of a sudden a cock pheasant flew up out of the brush and Mr. Modisette whistled to **H. R. Daniels** (a member of the company and hunting party), to shoot it. Mr. Daniels was far too busy to risk taking a shot and seeing this, Mr. Modisette threw his cap about eight feet in the air, striking the bird and knocking it to the ground. The bird was knocked senseless and Mr. Modisette had no difficulty in picking it up before it regained consciousness," the publication stated.

* * *

E. G. Guy, vice president and general manager of the Crystal Refining Co., Carson City, Michigan, left recently with his wife and children on a two week vacation trip to Erie, Kansas, his old home town.

Cut your FUEL OIL DELIVERY *Costs*

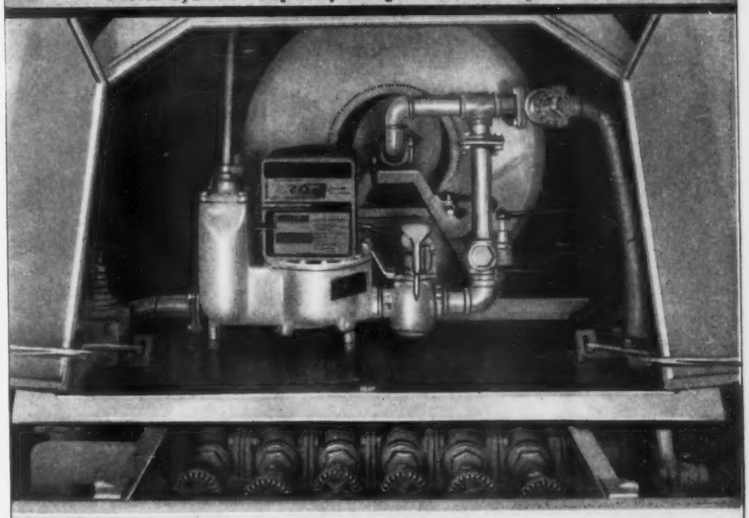
WITH GAR WOOD TANKS

● Attractively modern in appearance and thoroughly efficient in operation, Gar Wood tanks aid in stepping up profits. Gar Wood tanks, preferred by progressive oil marketers, afford greater value by reason of advanced design, craftsmanship and the use of highest quality materials.

Gar Wood produces every style of tank, in a wide range of capacities—conventional, semi-streamlined and fully-streamlined models. Every tank is specially engineered and completely equipped for the work it has to perform. When buying tanks, get everything—specify Gar Wood.

Ask for descriptive literature.

Conventional Gar Wood Tank Equipped with Pump and Meter System—capacity 800 gallons, 2 compartments.



Rear Compartment Showing Reel and Meter Installation.

Fully-Streamlined Gar Wood Tanks are Increasingly Popular.

GAR WOOD
INDUSTRIES, INC.
TANK DIVISION
DETROIT, MICHIGAN

World's Largest Manufacturer of Motor Truck Equipment

Everette Lee De Golyer

In recognition of "Distinguished achievement in improving the technique and practice of finding and producing petroleum", the American Institute of Mining and Metallurgical Engineers has awarded the Anthony F. Lucas Gold Medal for 1940 to Everette Lee De Golyer, of Dallas, Tex., consulting petroleum geologist. Previous recipients of the medal were J. Edgar Pew, vice president of the Sun Oil Co., and Henry L. Doherty, president of Cities Service Co.

Mr. De Golyer's dream of applying geophysical methods of prospecting for oil in the U. S. was first realized in 1924 with the discovery of the Nash Salt Dome by his torsion balance—later proved by drilling in 1926. More than three billion barrels of petroleum have been discovered since 1926 by geophysical methods in the development of which Mr. De Golyer was the outstanding leader, the A.I.M.E. points out.

Apprenticeship to his geological career was served with the U. S. Geological Survey, 1906-09. In 1911, he received a Bachelor of Arts degree from University of Oklahoma, and a year later became chief geologist for the Mexican Eagle Oil Co., continuing with the company as consultant until 1923. Meanwhile, he had formed the Amerada Petroleum Corp., the Rycade Oil Corp., the Geophysical Research Corp., and the Felmont Corp.

At the recent oil hearings of the Temporary National Economic (Monopoly) Committee, Mr. De Golyer appeared as a witness for the American Petroleum Institute, presenting data on production and reserves. He was re-elected an A.P.I. director at the Institute's convention last month.